

Teenage Mood: The Comparative Effects of In-person Communities versus Social Media

Joshua Kao

Received July 29, 2024

Accepted June 22, 2025

Electronic access July 15, 2025

Media consumption among teenagers is at an all-time high. Yet, existing literature supports the idea that excessive and addictive social media usage affects teenagers neurologically by setting dopamine levels below baseline and leads to shorter attention spans and more depressive symptoms. Existing literature also supports the importance of in-person social communities, which have been shown to boost long-term attention and general mood². This study adds on to existing literature by investigating the differing effects of social media engagement and in-person socialization with the added comparative effect on the same participant. This study also expands on previous work by adding the specificity of examining how the different communal activity types (e.g., performing arts, social support, athletics) affect the emotional outcome of teens differently. A Quasi-experimental design was utilized with 6 different activity groups of high school students (N= 52). Results supported the positive emotional outcomes of in-person social communities while corroborating the inverse effect of social media use ($p < 0.001$). Participants in the performing arts group experienced the largest emotional outcome gains, providing evidence for benefit when teenagers participate in activities where creative expression is needed. Participants in social support activities experienced significantly boosted mood and decreased stress levels, suggesting that youth participation in community service and social support activity groups benefit both others and themselves. Thus, partaking in communal activities reap positive emotional outcomes for teenagers while passive social media use reaps negative emotional outcomes for teenagers.

Introduction

In recent years, the impact of social media on children has been widely scrutinized; for example, many sources have found a direct correlation between social media use and depressive episodes since the rise of social media. The concern of social media's impact on teenagers is of national concern, with a recent Senate hearing featuring all major social media platforms' CEO's which focused on the impact of media on children's mental health¹.

A national United States survey found that teenagers had an average media usage time of 6 hours and 21 minutes daily, exceeding all other activities except sleep². In recent years, teenagers have spent more time on screens (e.g., social media, internet use, video games) and less time connecting with their peers³. Media use may appear harmless but existing literature suggests that this may have detrimental effects on adolescents' mental health.

Teenagers who excessively indulge in screen time through internet use, video games, television, and social media also reported higher rates of loneliness, social isolation, anxiety, sadness, and overall psychological distress⁴. However, these are correlational studies and other confounding variables may be the root cause of these mental health issues.

One hypothesis is that the correlation to poor mental health

is due to media use replacing time spent on in-person activities. In-person activities have historically fostered social-emotional growth through diverse activities, helping people create emotional self-regulation, teamwork and social skills, and social connectedness⁵. Between 2000 and 2015, the number of teenagers who socialized daily with friends in person dropped by more than 40 percent⁶. Ray and colleagues (2010) found that social media use had an inverse relationship to the amount of time available for pursuing activities such as sports, physical activity, community service, cultural pursuits, and family time, further working to the detriment of the teenager². Twenge et al. (2019) found that in-person social interaction declined as digital media usage increased and that adolescents low in in-person social interactions and high in social media use reported feeling lonely more often⁷.

Despite these findings, less has been done to understand what types of in-person activities foster an improvement in mental health and how this compares to mental health improvements or issues after social media use.

This study focuses on comparing different types of high school organizations students partake in and attempts to measure the mental health benefits gained through their participation and comparing that to the same students' mental health after social media usage.

Literature Review

For this paper, social media applications are defined as digital websites or applications that allow users to create, share, consume content, and participate with other individuals. The most common social media applications are Instagram, YouTube, Facebook, Twitter, and Snapchat. Other applications, such as gaming sites, are also included in this definition. A social community refers to an in-person, interpersonal network of people who provide support and bond together in a common activity or interest.

The relationship between social media use, in-person engagement, and mental health is nuanced and not as straightforward as grouping all social media as “bad” and all in-person activities as “good.” Blackwell et al (2013) found that the mood and health deviation an individual experienced after social media usage was dependent on the way the user engaged with social media and the content they consumed⁸. Those who actively used social media for enjoyment (through posting, liking, commenting, and direct messaging) had healthier results. After all, “online social networking sites (SNS) have tried to recreate face-to-face interactions on the web by allowing people to interact publicly or privately⁷.” In comparison, those who passively used social media experienced more anxiety, depression, and negative emotions⁸.

A framework for understanding mental health and its possible relationship to social media use and in-person social groups is Maslow’s Hierarchy of Needs. Maslow’s Hierarchy of Needs is a motivational theory in psychology that shows five basic needs (goals), categorized from lowest to highest in importance, that motivate people’s behavior⁷. At the bottom are physiological needs such as food, water, and rest, then safety which is encompassed by. In the middle, is “love and belonging” which encompasses one’s need for friendship, family, intimacy, and a sense of connection; “being comfortable with and connection to others that results from receiving acceptance, respect, and love.” These are followed by esteem needs such as prestige and accomplishments. Finally, at the top is self-actualization, which encompasses fulfilling one’s greater purpose. According to Maslow, the lower levels – physiological, safety, and belonging, are “deficiency” needs and if not met, leads to one feeling anxious and tense, even if the higher tiers are fulfilled.

Traditionally, the belonging tier was fulfilled using in-person interactions with others in the absence of digital technology but with the introduction of social media, it can be argued that some love and belonging can be gained from social media depending on how it is being used. A longitudinal study conducted by Harvard University spanning 85 years found that close relationships were the biggest factors in long-term happiness; not money, fame, intelligence, or genetics. More specifically, the study found the strongest correlation between one’s relationship with their family and their community to their overall happiness,

and as noted earlier, social media is a way to recreate face-to-face human interactions⁹. Concurrently, the use of social media can also be used to fulfill the “esteem” need which refers to status and recognition, which one can garner from social media “likes” and interaction with peers. It can also be used to possibly fulfill “aesthetic” needs – a sub-tier developed later – that refers to the need to beautify one’s life, as this relates to improvement of one’s surroundings and physical appearance, something that some areas of social media has a strong focus on. Finally, social media could relate to self-actualization, the highest tier that refers to the desire to accomplish goals to realize one’s full potential, typically pursuing career or life goals, getting married, becoming a parent, or developing other life goals. For example, one may feel their life goal is to become “internet famous” and use social media to do this, another may use social media to meet a future spouse. On the other hand, when one is constantly bombarded with social media posts of peers or others who seemingly have achieved these goals, they may feel the need to compare their own achievements, therefore feeling dissatisfied. These possible explanations and causes are also intertwined and not exclusive to one another - for example, “Studies have shown that when a family goes through financial stress for a prolonged time, depression rates are higher, not only because their basic needs are not being met, but because this stress strains the parent-child relationship. The parent(s) is stressed about providing for their children, and they are also likely to spend less time at home because they are working more to make more money and provide for their family.” As such, Maslow’s Hierarchy of Needs is a useful model to explain why social media use may be detrimental to mental health – whether that is due to an imbalance in the tiers, specifically a deficiency in the “belonging” tier even if others are met, a lack of fulfillment at the higher tiers due to perception of oneself, or too much time spent on social media rather than fulfillment of one of the tiers.

The benefits of friendships and a good family relationship whether in-person or virtual have been explored extensively but in-person adolescent social communities and which types confer the greatest mental health benefits has been less explored. Most in-person activities for adolescents, for example, likely fulfill the “belonging tier” as they foster friendships. Hansen and colleagues (2003) found that community activities promote interpersonal relationships by fostering a more complete understanding of peers from diverse ethnic and social classes⁵. Thus, teenagers who engage in positive social relationships will likely experience subsequent boosts in happiness and motivation, much like friendships, in general.

Introversion and extraversion levels were also explored extensively as they directly affect a participant’s adaptability to the effects of social communities. Individuals who are more extroverted tend to be more reactive to social stimuli than introverted individuals^{10,11}. More specifically, the study found

that the higher one's extroversion levels, the larger the extent of attention allocation to human faces during social interactions. This suggests that emotional stimuli have greater motivational significance and meaning for individuals characterized by high extraversion.

Communities can also be used to learn or lead to accomplishments - such as joining a drama club and producing a play or winning a robotics competition in robotics club - which can relate to the esteem tier and possibly self-actualization. In-person groups can also be grouped into those that result in altruism and community impact, such as environmental cleanup or helping with food banks, which can fall under self-actualization. Studies have noted positive findings on helping others and how it impacts one's own well-being^{12,13}. These latter motivations could also tie into Bandura's Self-Determination Theory that states that people are more motivated to perform when actions stem from internal motivation rather than extrinsic influences. Teenagers engaging in social communities are possibly motivated intrinsically to improve their skills in the social activity they are engaged in or that they are internally motivated to help others in the community through volunteer work.

This paper compares the effects on mental health after participating in a social community specifically in teenagers between each activity group type and to the effects of social media use. Due to the possible different needs outlined by Maslow, it is hypothesized that the different activities will result in varying levels of satisfaction and therefore mental health benefits compared to their mental wellbeing after social media use.

Methods

A quasi-experimental research design was employed, utilizing a survey administered to students at Palo Alto High School. Data collection occurred over a two-week period due to limited time during the school year to collect responses and subject participation.

The study included six experimental groups who expressed interest in participating in the study: Theater (Performing Arts), Chess (Strategic Thinking), Engineering (Strategic Thinking), Fencing (Physical Activity), Track and Field (Physical Activity), and Best Buddies (Social Support/Altruism). Each participant completed a pre-test and post-test survey. Participants initially filled out a pre-test survey to assess their mood, energy level, sociability, stress levels, focus, engagement, and physical prior to an organization meeting or activity. Immediately following the experimental activities, the same participants completed the same survey to measure changes. The survey utilized a standard Likert scale to assess participants' mood.

The pre-test survey also begins by asking which organization the participant is in and if they characterized themselves as introverted or extroverted.

In addition to the experimental activities, participants were asked to complete the mood survey while reflecting on their most recent instance of social media use.

Descriptive statistics, including mean, median, mode, and standard deviation, were used to summarize mood scores for each experimental group and survey item. Mood was classified based on the mean score per participant: a score between 1.0 and 2.9 indicated a strong negative mood, a score between 3.1 and 5.0 indicated a positive mood, and a score of 3.0 represented a neutral mood. In addition to descriptive statistics, Analysis of Variance (ANOVA) was conducted to examine whether significant differences in mood scores existed across the six experimental groups. This analysis allowed for the identification of any differential effects of the activities (Theater, Chess, Engineering, Fencing, Track and Field, Best Buddies) on mood. Further statistical measures, including range, outliers, and distribution, were explored to investigate potential patterns and relationships between pre-test activities and post-test mood scores.

Results

A total of 51 participants from the six experimental groups participated in the survey ($n = 51$).

Most participants rated themselves as "Better" or "Much Better" in categories of mood (67.5%), energy level (56.1%), sociability (68.3%), stress level (58.5%) after participating in their organization activity. A low percentage of participants rated themselves as "Worse" or "Much Worse" for their mood (10%), energy level (4.9%), sociability (12.2%), stress level (17.1%), and focus (10%) (Figure 1).

In contrast, very few participants rated themselves as "Better" or "Much Better" in categories of mood (18%), energy level (17.5%), stress level (15.4%), sociability (33.3%), and concentration (15.4%) after social media usage (Figure 2).

Collectively, the data suggests that these in-person social activities result in greater improvements in mood, energy level, sociability, calmness, focus, engagement, and physical state as compared to after social media usage (Figure 3). Participation in social community groups resulted in higher mood scores (Mean = 3.91, Standard Deviation = 0.95) than partaking in social media use (Mean = 2.89, Standard Deviation = 0.81) in the same individuals (Figure 5).

A two-tailed independent sample t-test (assuming equal variance) revealed a statistically significant difference in scores between the social community and social media groups, $t(87) = 5.46$, $p < 0.001$, with a 95% confident interval of [0.65, 1.4] (Table 1).

On a scale of 6, with "0" being very introverted and "5" being very extroverted, participants rated how naturally introverted/extroverted they were. The graph shows the average of each experimental group's score. Theater participants were the highest in extraversion, followed by track and field runners,

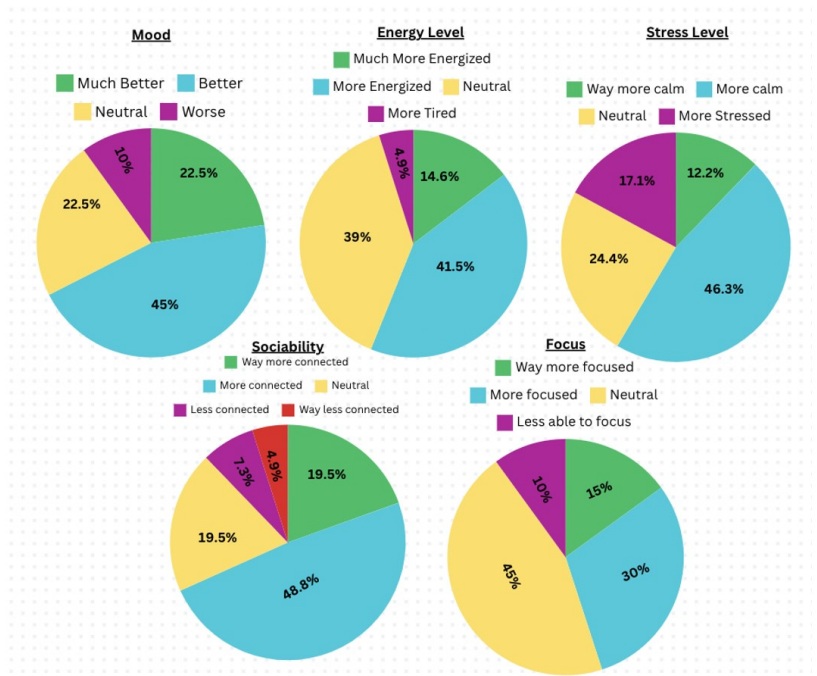


Fig. 1 Emotional outcomes from all experimental groups post in-person connection. Most participants experienced large increases in mood post social communal activity.

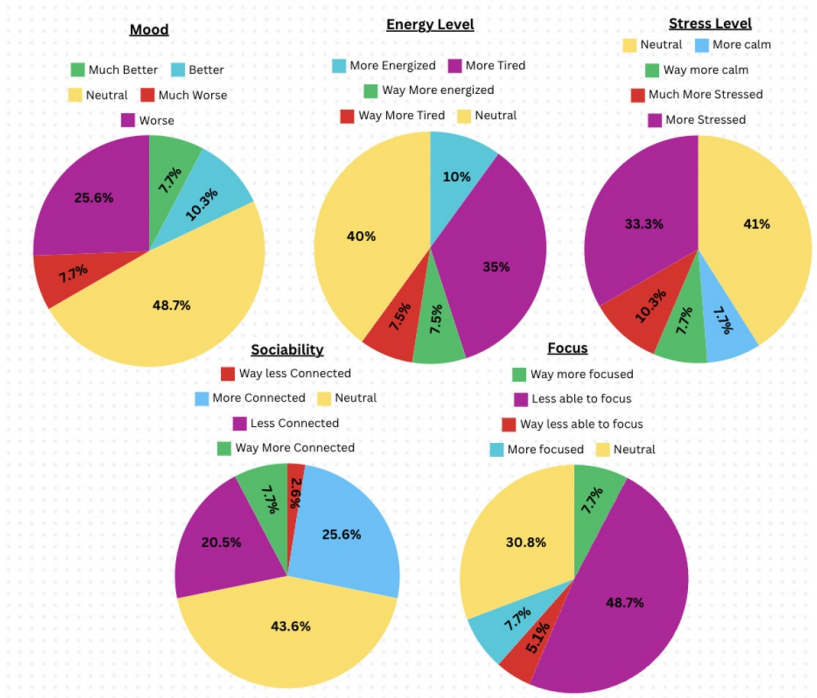


Fig. 2 Emotional outcomes from all experimental groups post social media use. Most participants experienced neutral to negative responses in mood post social media use.

Best Buddies members, engineering club members, fencers, and chess players were respectively the highest scoring individuals

in terms of extraversion (Figure 4).

The graph 4 represents the distribution of mood scores for

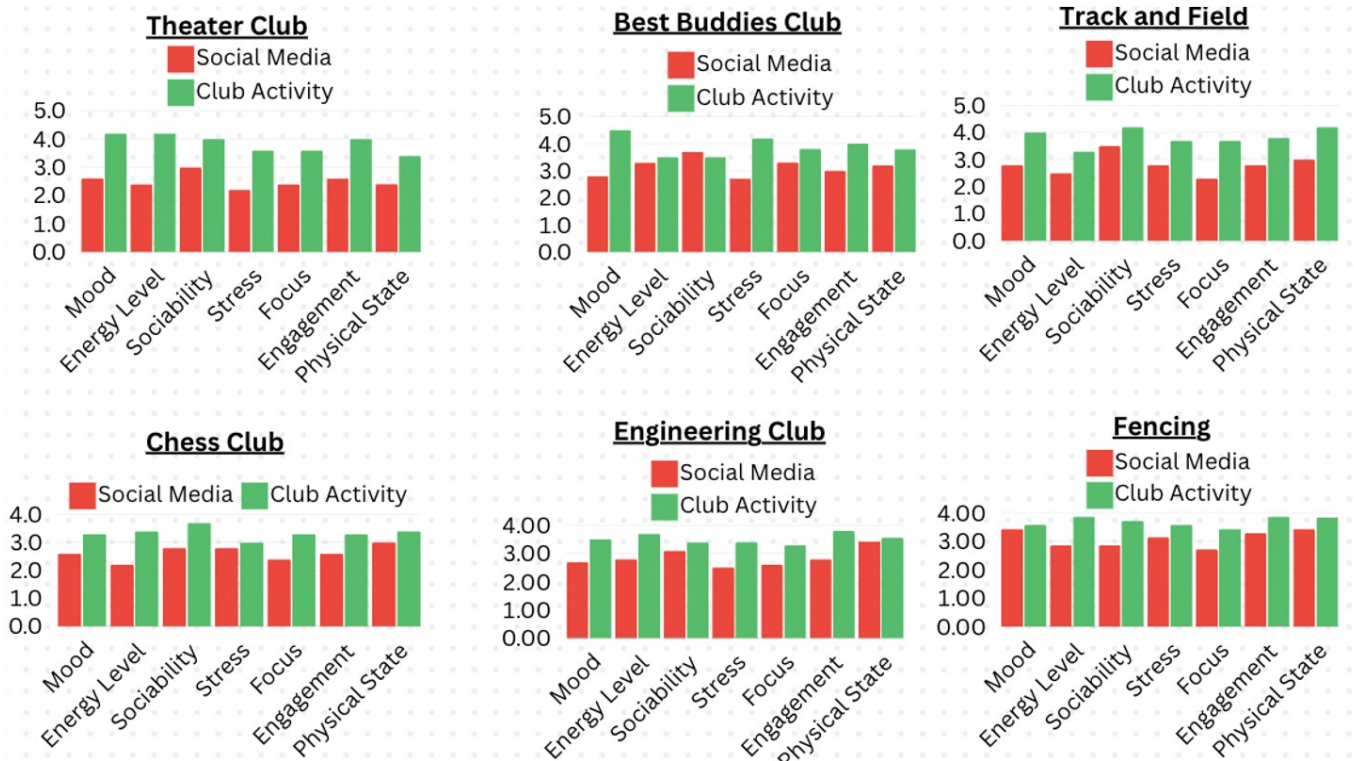


Fig. 3 Post-social media and Post-club activity Score Comparison. Post-club activity scores were collectively higher than post-social media scores.

each category, with the horizontal line inside each box representing the median, and the boxes displaying the interquartile range. Categories such as “Best Buddies” and “Engineering” appear to have higher median mood score changes than others while Fencing exhibits the broadest range of mood scores, indicating their variability.

Calculation 1: Mood ANOVA

F-statistic: 2.39

P-value: 0.0492; P-value is less than 0.05, so statistically significant difference in mood scores across all categories.

Explanation 1: ANOVA was used to compare the variability between groups to the variability within groups. The F-statistic formula I used was I found the mean square between groups (MSB) and divided it by the mean square within groups (MSW). $MSB = (\text{Sum of squares between groups (SSB)}) / \text{Degrees of freedom between groups (k-1} \rightarrow \text{number of groups -1)}$ $MSW = (\text{Sum of squares within groups (SSW)}) / \text{Degree of freedom within (n-k} \rightarrow \text{total number of observations minus number of groups)}$

The p-value was derived from the F-distribution: $p\text{-value} = P(F > F_{\text{observed}} | df1, df2)$

This graph visualizes the distribution of energy level scores across the categories. Categories such as Chess and Track and Field show slightly lower median energy levels than other

groups; additionally, Best Buddies and Fencing seem to have the most variability in their change in energy level scores.

Explanation 2: The same process as explanation 1 was taken to calculate for energy level.

Table 1 Statistical Significance Tests

Score	t	df	p	Cohen’s d
Equal variances	5.46	87	< .001	1.16
Unequal variances	5.47	85.53	< .001	1.16

The differences in post-social communal and post-social media scores were statistically significant.

Discussion

This study investigated the impact of social media engagement and in-person communal activities on the mood and attention of teenagers. Many valuable insights were garnered through measuring the different moods, attention, and general emotional outcomes after engaging in a diverse range of communal activities and after using social media.

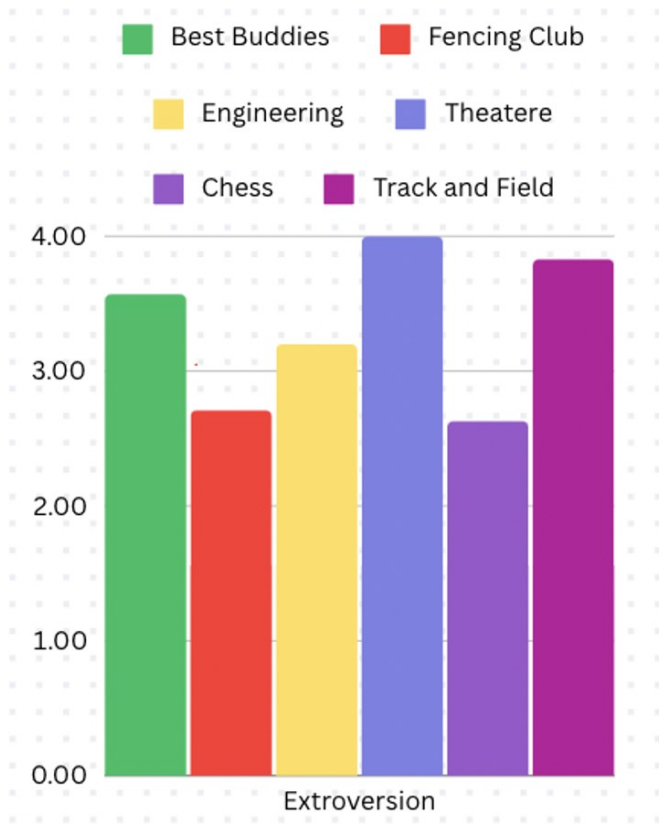


Fig. 4 Club Introversion-Extroversion Levels Scores Comparison
Individuals in the theater and track and field activity group rated themselves as most extroverted, while fencers and chess players rated themselves the most introverted.

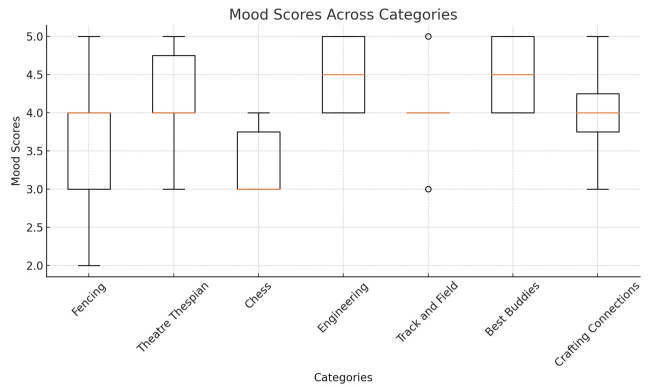


Fig. 6 Mood Score Changes Across Groups

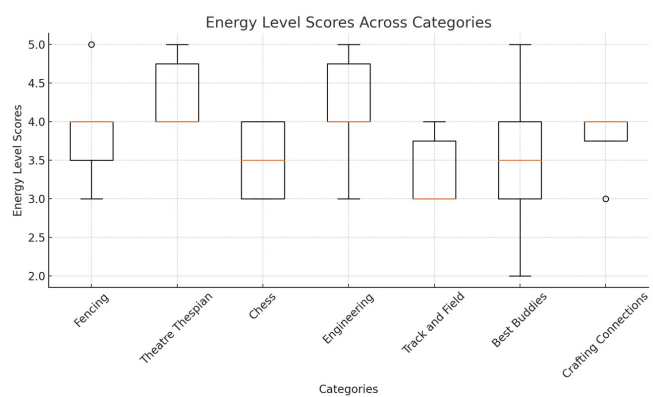


Fig. 7 Energy Level Changes Across Groups

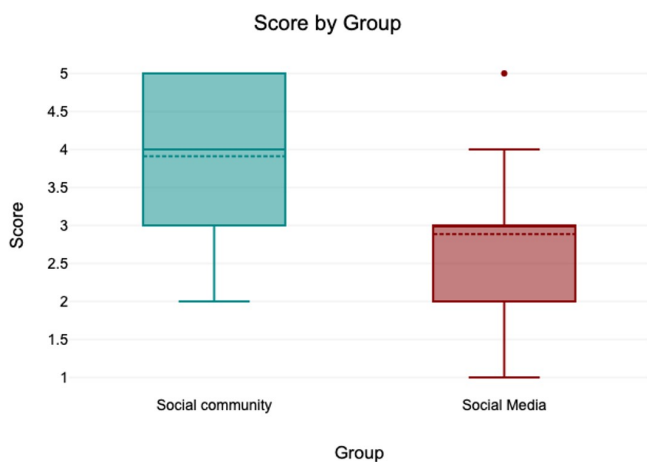


Fig. 5 Box and whisker plot for all experimental groups
Post social communal scores were notably higher than post social media scores.

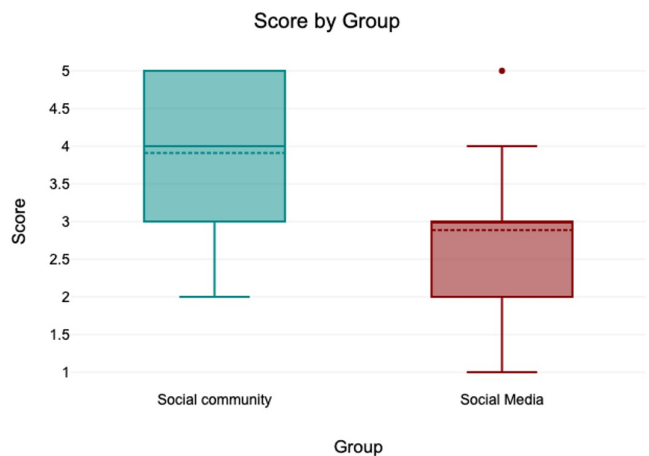


Fig. 8 Post social communal scores were notably higher than post social media scores.

Performing Arts Activities - Theatre Club

The theater club, a performing arts experimental group, experienced the largest increase in gains across all categories after club

activities compared to social media suggesting that teenagers may benefit from participating in performing arts communities where creative expression is needed.

Social Support Activities- Best Buddies Club

The Best Buddies club cohort, showing significantly elevated mood and decreased stress levels (average rating of 4.5) increase in mood after the social activity (Figure 6, Figure 7).

Strategic Thinking Activities- Chess and Engineering Clubs

Another discovery came from the chess club, whose collective introversion levels were lower than the other experimental groups (average rating of 2.63) yet experienced notably large gains in energy level, mood, focus, and sociability (Figure 6, Figure 7). The chess and engineering clubs, which primarily exercise one's brain in strategic thinking, also experienced the least physical gains after the club.

Athletics—Track and Field and Fencing Clubs

The track and field group experienced the largest gains in physical state and focus after practice compared to other groups.

Conclusion

In-person social connection appears to improve mental health more so than social media, which corroborates with previous literature^{2,6-9}. However, this study adds an element of comparing different types of in-person social activities in the same population. Altruistic activities appear to confer boosted mood and decreased stress, physical group activities do improve physical state, and strategic thinking does lead to elevated energy levels and mood.

Despite interesting findings, this study cannot yet be generalized to the public due to its small sample size as it was difficult to enroll enough participants into the study given the limited time of the author to carry out study. The data collection for each experimental group also occurred over the course of a day, thus only measuring short-term mood changes. All participants of this study were also located within the Bay Area in Northern California. Different geographical regions, with different cultural norms and values, may yield different results. Thus, a long-term study, spanning over multiple years and including adolescents from a diverse set of geographical locations, cultural norms, and values may yield interesting and more detailed answers to how teenage mood is affected comparatively by social media versus in person social communities.

While the author would have liked to delve deeper into how different types of social media usage (passive or active) affected mental health, this was beyond the scope of this study. Prior

research suggests that passive and active social media use confers different benefits and detriments, while passive and active social media use can also be further split and categorized (e.g., encountering bullying, social pressures, or conversely consuming motivational content, making friends, or learning something new etc). The study was also unable to have the same students use social media and report back their self-perceived mood, and rather, they were asked to reflect on their past social media use, which could introduce inaccurate results. By understanding the more nuanced needs social media use fills or exhausts will need to be studied to better understand its relationship to mental health.

Acknowledgments

I'd like to thank Ms. Erin Angell, my Advanced Authentic Research (AAR) teacher, for her support and encouragement and Ms. Rachael Kaci for her introduction of me into the AAR program.

References

- 1 A. Khalaf, A. Alubied and A. Rifaey, *The Impact of Social Media on the Mental Health of Adolescents and Young Adults: A Systematic Review*.
- 2 M. Ray and K. Jat, *Effect of Electronic Media on Children*.
- 3 B. Wagner, A. Folk, S. Hahn, D. Barr-Anderson, N. Larson and D. Neumark-Sztainer, *Recreational Screen Time Behaviors during the COVID-19 Pandemic in the U.S.: A Mixed-Methods Study among a Diverse Population-Based Sample of Emerging Adults*.
- 4 V. Nakshine, P. Thute, M. Khatib and B. Sarka, *Increased Screen Time as a Cause of Declining Physical*.
- 5 D. Hansen, R. Larson and J. Dworkin, *What Adolescents Learn in Organized Youth Activities: A Survey of Self-Reported Developmental Experiences*.
- 6 J. Twenge, *Have Smartphones Destroyed a Generation?* *The Atlantic*, <https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/>.
- 7 ALembke, *Dopamine Nation: Finding Balance in the Age of Indulgence*.
- 8 S. Chen, K. Zhi and Y. Chen, *How Active and Passive Social Media Use Affects Impulse Buying in Chinese College Students? The Roles of Emotional Responses, Gender, Materialism and Self-Control*.
- 9 L. Mineo, *Good Genes Are Nice, but Joy Is Better*.
- 10 I. Fishman, R. Ng and U. Bellugi, *Do extraverts process social stimuli differently from introverts?*
- 11 E. Naidu, E. Paravati and S. Gabriel, *Staying Happy even when staying 6ft apart: The relationship between extroversion and social adaptability*.
- 12 C. Schwartz, J. Meisenhelder, Y. Ma and G. Reed, *Altruistic Social Interest Behaviors Are Associated With Better Mental Health*.
- 13 S. Post, *Altruism, happiness, and health: It's good to be good*.

Appendix

Appendix A: Execution Plan Appendix A Execution pLan

Appendix B: Initial inquiry approach, data collection tools, and data analysis technique Appendix B Inquiry Approach

Appendix C: Survey questions <http://tinyurl.com/3htekz7n>

Appendix D: Complete comprehensive survey results (Q11-Q24 used in results section): Data_All.240223.pdf