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Social Media Influence on Emerging Adults' Prosocial Behavior: A Systematic Review

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ABSTRACT

Current literature has provided substantial empirical evidence on how different types of factors influence prosocial behavior, but limited literature explores the relationship between online social media factors and their psychological influence on emerging adults' prosocial behavior. Moreover, the majority of experimental investigations have utilized self-reported questionnaires or irrelevant economic games to reflect people's prosocial behavior instead of measuring prosocial behavior demonstrated in real-life, natural settings. Considering the gaps in past research, this systematic review aims to identify literature regarding the influence of social media on emerging adults' prosocial behaviors. The review focuses on studies that observed individuals' prosocial behavior in real-life settings to eliminate social desirability bias and accurately establish the effects of social media on emerging adults' prosocial behavior.

Introduction

Recent technological advancements have revolutionized how people connect, interact and develop relationships with others locally and globally through easy access to online communications (McFarland & Ployhart, 2015). Specifically, in the area of prosocial behavior, studies have demonstrated that online content influences how people form their opinions, stereotypes, and impressions of others, potentially impacting their prosocial decision-making processes (Balmas & Halperin, 2022; Guo et al., 2021). For instance, people commonly use social media platforms to gain knowledge, co-create and or share content, and participate in discussions of their interests (Kietzmann et al., 2011; Lysenstøen et al., 2021; Slattery et al., 2021).

Subsequently, this internet exposure shapes the thoughts and attitudes that influence, for instance, the various ways in which people decide to donate money to the less fortunate, volunteer, or act philanthropically (Cikara et al., 2014; Levy et al., 2016; Xu et al., 2009). Such influences have recently been targeted at younger generations who make up the majority of social media platform users, where they use two or more social media sites daily (Rasmussen et al., 2020). Statistics also revealed that more than 80% of

individuals from age 18 to 35 years old use social media as compared to older adults (Lin, 2023). The focus on emerging adults (i.e., 18 to 35 years old) also stems from their superior capabilities in making prosocial moral judgments as cognitively developed adults when compared to adolescents and children (Janssens & Deković, 1997). Hence, the current study seeks to investigate the specific variables on social media platforms that influence prosocial behavior amongst emerging adults. The underlying psychological mechanisms driving these social media influences will be explored in this study through an evaluation of existing measurements of prosocial behavior in natural settings.

Social media

Social media have been defined as mobile and web-based internet services that create a highly interactive platform for people to interact with others (Malik & Ahmad, 2019). People socialize by openly providing feedback, taking part in reviews and discussions, and sharing personal information and opinions in a fast-paced social environment (Kietzmann et al., 2011; Lysenstøen et al., 2021). The fundamental component

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that differentiates social media from traditional media (e.g., newspaper, television, radio), including electronic versions of traditional media, is that social media allows social interaction amongst users whereas traditional media is generally a one-way communication channel with limited interaction or feedback from users (Wang et al., 2012).

Social media rose to popularity in the early 2000s when MySpace hit a million users in 2004, arguably the beginning of social media as we know it (Ortiz-Ospina, 2019). Popular social media platforms include Facebook, YouTube, and Reddit (Statista, 2023). Generally, there has been an estimated 30% increase in daily social media usage in recent years as social media platforms continuously provide an accessible virtual medium for individuals to seek social information (e.g., others' opinions, emotional reactions, and attitudes), form relationships to fulfill their basic need for relatedness, and to guide and determine their social interactions and actions toward others (Balmas & Halperin, 2022; Madein & Sholihin, 2015). Moreover, people are inclined to use social media in attempts to preserve their social identity during situations where physical access is limited (Schmalz et al., 2015) such as the recent COVID-19 pandemic during which there has been an increase in social media usage (Cinelli et al., 2020; Gottlieb & Dyer, 2020). Therefore, based on the Technology Acceptance Model, individuals are more inclined to adopt these new technologies as there is an increase in perceived usefulness and perceived ease of use of these social media platforms where individuals can connect with others and seek for a wider range of information (Naqvi et al., 2020).

Studies have also demonstrated that the extensive usage of social media platforms has influenced people's prosocial or pro-environmental behavior such as recycling solid waste to reduce harmful carbon emissions (Sujata et al., 2019), sustainable energy consumption to reduce one's contribution to global warming (Foster et al., 2011), and helping or volunteering behaviors to benefit others in need (Kuem et al., 2017; Raza et al., 2022). For instance, when individuals are exposed to others exhibiting these prosocial or pro-environmental acts online, they tend to imitate the same behavior (Eckhaus & Sheaffer, 2019; Malik & Ahmad, 2019). Stephen (2016) explained that this behavior imitation can simply be caused by being exposed to others' opinions or even just exposure to friends' lives as portrayed on social media platforms. Such social influence is dependent on how various informational and social characteristics of social media

environments have been presented. For example, studies have shown that using mobile devices to access social media content increases one's feelings of psychological ownership and endowment (Brasel & Gips, 2014), while exposure to the content shared by one's close friends on social media platforms will lower the user's self-control in exhibiting subsequent behaviors (i.e., the user will exhibit similar behavior to what one has been exposed to on social media platforms; Wilcox & Stephen, 2013). Similarly, recent studies have also explained that there would be an increase in the exhibition of a behavior after exposure to information from their online communities. Individuals are inclined to perceive themselves as similar to or connected with their online communities, thus leading to the adoption of behaviors or attitudes associated with social media posts made by the same community (Yushi et al., 2018). Based on this need to identify with an online community, individuals may engage in a certain behavior to comply with what they perceived and internalized as societal norms or values to avoid being ostracized by their social networks (Abbas Naqvi et al., 2020).

Despite the positive influences on people's behavior, social media platforms have also led to the exhibition of negative behaviors. For instance, during the COVID-19 pandemic, studies have revealed that there was an increase in social media users misusing social media platforms to transmit false information about the causes of COVID-19 and effective treatments for the disease (González-Padilla & Tortolero-Blanco, 2020). Moreover, Fisher (2013) found that access to social media has led to an increase in misuse or abuse of this technology where there has been an increase in cases of threatening, harassing, and humiliating behaviors toward others. This cyberbullying trend has sparked interest in areas of research as researchers attempt to understand the online phenomenon of "keyboard warrior" behavior (i.e., concealing one's true identity behind an online persona) and its social influence on other social media users (Yusuf et al., 2020).

Other potential negative effects of social media usage include detrimental effects on mental health. Studies have shown that while social media can help facilitate connections, some reported feelings of loneliness due to cyberbullying or social exclusion, superficial and meaningless interactions caused by the lack of depth and intimacy that face-to-face engagement could provide, and passive consumption (e.g., scrolling through feeds without actively engaging or interacting) of social media content (H D et al., 2023). Increased anxiety has also been observed amongst

social media users as there has been more exposure to international issues (Michikyan et al., 2023). For example, during the peak of the COVID-19 pandemic, people were feeling more anxious when there were increasing reports of deaths. Moreover, social media platforms often present curated and idealized versions of people's lives, which could potentially lead to feelings of inadequacy, envy, and life dissatisfaction when comparing one's own life to other (Bonsaksen et al., 2023).

As empirical evidence has demonstrated the strong impact social media has on people's positive and negative behavior, it is therefore imperative to explore the underlying reason for people's decision to act prosocially (e.g., self-awareness, aligning one's online representation to their actual self) or negatively toward others (e.g., hiding behind a fake persona to avoid consequences in one's actual life). Subsequently, evidence demonstrating the positive use of social media can inform researchers about effective methods of using social media platforms to garner prosociality from the online community (e.g., Lim et al., 2021; Slattery et al., 2021).

Prosocial behavior

Definition of prosocial behavior

Prosocial behavior describes a broad class of voluntary actions intended to benefit others or society as a whole (Batson, 1991; Carlo et al., 2010; Eisenberg et al., 2006). These actions include helping others in need (e.g., volunteering, blood or monetary donation, protecting someone from harassment, helping an accident victim), sharing personal goods and information, providing emotional support (e.g., showing empathy, comforting, listening), and cooperating with others (McGuire, 1994; Pearce & Amato, 1980).

In addition, pro-environmental behaviors have been recently classified as a subset of prosocial behavior (Neaman et al., 2018). Although research has traditionally defined prosocial behavior as human-oriented actions, Ramus and Killmer (2007) argued that pro-environmental and sustainable behavior benefit society as a whole when viewed from a long-term perspective and might thereby be considered as prosocial. Frameworks for environmental concerns also support this perspective because such sustainable behaviors are driven by altruistic decisions (e.g., Schultz, 2000, Stern et al., 1993). Individuals have to forgo some immediate self-benefits when they cooperate in pro-environmental efforts to sustain the future survival and productiveness of the environment (Otto et al., 2021).

However, recent studies have also revealed that the underlying motivation that drives human-oriented prosocial behaviors is fundamentally different from those that drive pro-environmental behaviors (Neaman et al., 2021). Individuals who exhibit pro-environmental behaviors are mainly driven by their connectedness to nature, whereas individuals who exhibit prosocial behaviors are mainly driven by their concern for the well-being of other humans (Duong & Pensini, 2023; Van Der Linden, 2015). Therefore, empirical evidence suggest that pro-environmental behaviors should not be conceptualized as a type of prosocial behavior for this study.

There have also been debates about whether supporting social rights movements can be conceptualized as a form of prosocial behavior. For instance, Tufekci and Wilson (2012) found that supporting social rights movements is a form of prosocial behavior, where social media has been used as a tool to promote and amplify users' help in fighting for the rights of vulnerable populations. However, other studies have indicated that individuals participating in social rights movements are power-oriented (i.e., challenging authorities to legitimize themselves) rather than human-oriented such as exhibiting genuine actions to directly help vulnerable people (Christiansen, 2011; Flynn, 2011). Therefore, supporting social rights movements will also not be conceptualized as a type of prosocial behavior for this study as there is a lack of human-oriented motivation underlying individuals' support for social rights movements.

Theoretical underpinnings of prosocial behavior

Research has demonstrated that individuals' decision-making processes on prosocial behavior could be altered by manipulating their reliance on emotions (Kvarven et al., 2020; Rand, 2016). For instance, Gärtner et al. (2022) found that individuals whose decisions were induced by affect (e.g., empathy, positive or negative moods) had exhibited more prosocial behavior in a series of incentivized games as compared to those whose decisions were based on rational reasoning (e.g., careful planning and analysis of cost and benefits). Participants who were exposed to websites that were perceived to be emotionally positive or negative also exhibited more volunteering and philanthropic behaviors (Slattery et al., 2021). Recent theories (e.g., Mood-Behavior Model, Mood-Maintenance Theory) postulate that individuals behave prosocially when experiencing positive emotions because they would like to prolong their current state (Mesurado et al., 2021). Similarly, individuals who experienced negative emotions would exhibit prosocial acts in an

attempt to return to their original positive state or reduce the uncomfortable, negative feelings (Gendolla, 2000).

Ingroup favoritism has also been found to impact prosocial behavior wherein individuals demonstrated more prosocial acts toward ingroup members than outgroup members (Everett et al., 2015; Graupensperger et al., 2018). Among other emerging factors, research has established that religiosity enhances the impact of such intergroup biases because people reported more willingness to help ingroups when primed with religious concepts (Hunsberger & Jackson, 2005). The same religious primes caused people to display discrimination toward outgroup-like targets due to self-preservation purposes (e.g., Johnson et al., 2010; Saroglu et al., 2005).

Empathy could mediate ingroup favoritism (Dovidio et al., 2004; Vescio et al., 2003). For instance, the use of perspective-taking increased prosocial behavior toward outgroup members while also decreasing individuals' negative stereotypes and prejudice about the outgroup (e.g., Batson et al., 1997; Finlay & Stephan, 2000). Previously, research has also revealed that empathy toward someone is linked to prosocial cooperative behaviors, especially for people who have had the opportunity to understand an outgroup's plight through increased internet publicity (Balmas & Halperin, 2022; Cikara et al., 2014; Levy et al., 2016; Xu et al., 2009). It was found that a positive portrayal of an individual from an outgroup, more so of a prominent member, in a news article would cause people to think of the outgroup positively and increase their empathy levels toward the outgroup. Subsequently, prosocial behaviors toward that particular outgroup increased where participants were more willing to help the citizens from the outgroup and to make substantial monetary donations to benefit those same citizens.

According to the Social Exchange Theory, individuals might also implement a cost-benefit analysis to determine the net worth of acting prosocially (Afolabi, 2014; Bowles & Gintis, 2011; Tan & Singh, 2022). A host of motivators (e.g., peer approval and or acceptance, reduction of personal distress, expectations of personal gain) could influence the person's decisions as they aim to maximize their rewards and minimize their losses (Boxer et al., 2004; Carlo & Randall, 2002; Findley-Van Nostrand & Ojanen, 2018). Other research variables such as gender and personality traits also demonstrated an influence on prosocial behavior. Females demonstrated more prosocial behavior than males due to their superior ability in

perspective-taking and being empathic (Abdullahi & Kumar, 2016; Hirschberger et al., 2005; Wierking & Bekkers, 2012) while individuals scoring higher on the Honesty-Humility and Agreeableness dispositional factors in the HEXACO model of personality (Ashton & Lee, 2009) were found to cooperate more with others (Hilbig et al., 2014).

Lastly, cultural norms has also been found to significantly influence the type of prosocial behavior, as some cultures may prioritize community support and interdependence while others focus on their own individual goals. The distinction between collectivistic and individualistic cultures is particularly relevant in understanding these dynamics (Lai, 2015; Padilla-Walker et al., 2022). In collectivistic cultures, individuals prioritize social relationships and interconnectedness where they engage in prosocial behaviors that aim to benefit the community as a whole (Wong et al., 2020). Research has shown that individuals in collectivist cultures are thus driven to exhibit helping, donating or volunteering behavior due to their strong sense of responsibility toward adherence to social norms and their inclination to establish social harmony (Moon et al., 2018; Tse et al., 2021). On the other hand, individuals in individualistic cultures prioritize personal autonomy and achievement, thus they may engage in prosocial acts based on long-term self-oriented reasons or specific personal motivations (e.g., personal reputation, social recognition, reciprocity; Duclos & Barasch, 2014; Lange, 1999). Therefore, literature has shown that levels of prosocial behavior vary across cultures which reflects how cultural values influence the transmission of prosocial behavior.

Social media influence on emerging adults' prosocial behavior

Emerging adulthood has been defined as individuals between 15 to 35 years old (National Youth Council [NYC] Singapore, 2012). However, most laws under the Singapore Penal Code and the United Nations Conventions of the Rights of the Child (UNCRC, 1995) identify individuals under the age of 18 years as children because of their lack of higher cognitive functions to make informed decisions for themselves (Singapore Children's Society, 2005). Moreover, prosocial behavior has been frequently associated with morality that involves abstract thinking (e.g., perspective-taking) and sophisticated decision-making processes (e.g., assessing situational cues; Eisenberg et al., 1983). The cognitive-developmental perspective (e.g., Kohlberg's (1973) theory of moral development,

Piaget's (1936) cognitive development theory) posits that this prosocial moral judgment comes with an increased pre-frontal cortex development starting from the age of 18 years old (Carlo et al., 1996; Eisenberg, 1986). Hence, individuals who are 18 years old and above are more capable of using higher-order cognition to evaluate personal values and beliefs, interpersonal relationships, and societal norms before deciding whether to act prosocially (Janssens & Deković, 1997). Therefore, for this study, emerging adults will be defined as individuals from 18 to 35 years old who are legally responsible for their actions.

World statistics have also revealed that more than 80% of emerging adults (i.e., 18 to 35 years old) are currently using social media and it is a popular daily activity for them (Vannucci et al., 2017). Current estimates also indicated that 50 to 88% of emerging adults frequently visit Facebook, Instagram, Snapchat, and Twitter (Coyne et al., 2013; Greenwood et al., 2016; Vannucci et al., 2019). Generally, statistics have demonstrated that emerging adults reported using multiple platforms simultaneously for at least six hours per day, which is more than their older peers (Perrin, 2015; Scott et al., 2017). Considering the extensive usage of social media amongst emerging adults, it is therefore important to understand how social media could influence emerging adults' decision-making processes and the exhibition of prosocial behavior thereafter.

Gaps in current literature

Despite the substantial amount of empirical evidence on how different factors have influenced prosocial behavior, limited literature explores the relationship between online social media factors and their psychological influence on emerging adults' prosocial behavior. Studies that did explore the effects of social media on prosocial behavior were, however, using a holistic positive versus negative view of the context (e.g., ingroup versus outgroup, distressing situations) to determine if the target audience had demonstrated increased levels of prosociality (Balmas & Halperin, 2022). Therefore, there is currently limited information or research pinpointing the specific social media factors (e.g., number of likes or comments, characteristics of the context, to whom and how the content is delivered, length of content, credibility) that influence emerging adults' prosocial behavior.

Moreover, little research has focused on measuring the exhibition of actual prosocial behavior in natural settings (e.g., not self-reported, not in hypothetical scenarios). Current literature mainly focuses on

measuring self-reported prosocial behavior where participants indicated their intentions to act prosocially to others in various hypothetical contexts without validating if they have actually engaged in these behaviors (e.g., Afolabi, 2014; Graupensperger et al., 2018; Martí-Vilar et al., 2019; Padilla-Walker et al., 2008). Such self-reported measurements in examining prosocial behavior are subject to social-desirability biases (Awan et al., 2020). Social desirability bias postulates that individuals tend to selectively respond to self-reported measures in a manner that reflects them in a positive light instead of providing true and actual representations of their prosocial intentions (Holtgraves, 2004).

Although the use of observed prosocial behavior as measurement has been found to reduce such social desirability biases, various studies that elicited prosocial behavior in experimental set-ups such as economic games (e.g., Drouvelis & Grosskopf, 2016; Ertör-Akyazi & Akçay, 2021; Gärtner et al., 2022; Li et al., 2019) often have little practicality and relevance to real-life, natural settings (Awan et al., 2020). The economic games methodology typically involves experimental paradigms such as the Dictator Game, Ultimatum Game, and Trust Game, which are widely used in social psychology research to investigate decision-making and social interactions (Piff et al., 2015). These games simulate economic exchange situations where participants make decisions about allocating resources, such as money, to themselves and others. While these games offer controlled environments for observing prosocial behavior, they often oversimplify the motivations driving prosocial behavior as the complex social dynamics involved in the decision to act prosocially has been reduced to monetary transactions (e.g., promoting strategic decision-making rather than genuine prosocial tendencies; Dorrough et al., 2020). Moreover, economic games typically involve isolated interactions with strangers in artificial environments, which fails to capture the nuances of personal interactions or relationships (Thielmann et al., 2020). The artificiality of these games also limits their applicability to diverse social norms and contexts, thus hindering the generalizability of findings to broader social contexts (Thielmann et al., 2021). As such, more investigations are required to determine people's observable prosocial behavior (e.g., number of hours volunteering, providing contact information for future prosocial opportunities, donations, and helping) to emphasize the importance of complementing experimental evidence with field studies and naturalistic observations.

Present study

Considering the gaps in past research, this systematic review aims to establish current literature regarding the influence of social media variables on the cognitive and affective processes of emerging adults and its subsequent impact on individuals' prosocial behaviors. The review also focuses on studies that observed individuals' prosocial behavior in real-life settings to eliminate social desirability bias and provide increased accuracy in establishing the effects of social media on emerging adults' prosocial behavior.

Unlike the predominant tendency in past literature, which often studies social media and prosocial behavior in isolation, the novel aspect of this study lies within the intersection of both fields whereby innovative research and new insights could emerge from this unique approach. In this current age of rapid technological advancement, social media provides a unique platform for studying and promoting prosocial behavior on a larger scale, thus offering new opportunities for research and intervention. Moreover, the digital nature of social media also allows for the collection and analysis of large amounts of data to provide insights into human behavior and social dynamics in ways that were not possible before. Overall, studying social media and prosocial behavior together would open new avenues for understanding and promoting positive social change in this digital era which provides useful information to political, medical, psychological, and sociological professionals. These professionals can leverage these psychological processes to potentially promote prosocial behavior toward any social cause through websites or social media platforms.

Searches in Cochrane and PROSPERO databases indicated that there were no systematic reviews on determining the specific elements of social media that influence emerging adults' prosocial behavior in real-life settings (e.g., offline and online prosocial acts). Three research questions are proposed to examine the above:

1. What are the specific social media factors that influence prosocial behavior amongst emerging adults?
2. What are some observable prosocial behaviors that can be elicited in a natural setting, and how are they measured?
3. Why and how do these social media variables influence prosocial behavior?

Methodology

This systematic review was registered in the Open Science Framework (OSF) Registries (Registration

DOI: [10.17605/OSF.IO/H5V3N](https://doi.org/10.17605/OSF.IO/H5V3N)). The framework for this systematic review was developed according to the Preferred Reporting Items for Systematic Review and Meta-Analyses checklist (PRISMA; Page et al., 2021). The SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type; Cooke et al., 2012) tool for mixed methods research was also adopted as a standardized criterion selection and search strategy to facilitate the collection of both quantitative and qualitative studies.

Information sources and search strategy

The data search was conducted from 14 to 30 April 2022 from seven multidisciplinary databases (Cochrane, CINAHL, ProQuest, PubMed, Ovid, Scopus, Web of Science). Quantitative and qualitative studies published since January 2004 (i.e., the beginning of social media) were searched. The following strategy was used to search the word "prosocial" and its synonyms in the title of the articles found in each database: ("Prosocial Behavior" OR Pro-sociality OR Prosocial OR altruism OR humanitarianism OR selfless* OR "social concern" OR self-sacrific* OR volunteer* OR benefi* OR help* OR philanthropy OR kind* OR charit* OR benevolen*). As second-level keywords, the terms "social media" OR online OR "social platform" OR "social media platform" OR "social service media" OR "social media website" OR "social networking website" were also searched across the articles' titles, abstracts, and keywords. This level was included to focus on retrieving research that examines specific factors on social media as independent variables that influence individuals' behavior. Each level of keyword(s) was connected by the Boolean AND.

Eligibility criteria

The inclusion and exclusion criteria were formulated according to the SPIDER tool (Cooke et al., 2012). The inclusion criteria used to screen and select research included (a) quantitative (e.g., randomized controlled trials, quasi-experimental, experimental) and qualitative (e.g., correlational studies, observations, case studies, content analysis) studies that (b) use behavioral measures (e.g., observable prosocial behavior recorded by the researcher or participants' indication of completing a particular type of prosocial behavior) to determine prosocial behavior, and (c) recruited participants who are 18 to 35 years old. In addition, while self-reports of prosocial behavior were excluded as the sole dependent measure of prosociality, studies utilizing self-reports in conjunction with

objective measures or observational methods were deemed permissible for inclusion.

Published articles and grey literature (e.g., theses, dissertations) were eligible for inclusion. Based on initial exclusion criteria, studies that had no English records and did not have the search keywords in the title, abstract, and keywords of the articles were removed. Subsequent exclusion criteria removed articles that did not examine social media as an independent variable or did not measure the exhibition of prosocial behavior as a dependent variable (i.e., uses self-reported measures).

Study selection process

Two reviewers independently assessed all retrieved records using the free-to-public web tool Rayyan (Ouzzani et al., 2016). Each reviewer screened the titles and abstracts of the articles and coded them using ‘yes’, ‘no’, or ‘maybe’ to determine their eligibility based on the inclusion and exclusion criteria as mentioned above. The studies coded unanimously as ‘yes’ were eligible for further quality assessment, whereas the studies assessed with unanimous ‘no’ were removed. The studies coded as ‘maybe’ or studies which did not reach a unanimous decision between the two reviewers were resolved via discussion and consensus.

Assessing the risk of bias

Two reviewers further screened the full text of the nine eligible studies to assess their methodological quality independently. Based on the Cochrane Handbook for Systematic Review of Interventions’ guidelines for assessing the risk of bias (Higgins et al., 2011), the studies were assessed across seven domains. They were rated either ‘high risk’, ‘low risk’, or ‘unclear’ as presented in the risk of bias graph and summary (Figures 1 and 2).

The last domain indicating “Other Bias”, considered each study’s effect size, potential issues with each independent or dependent variable’s measurement(s), lack of generalizability due to recruitment bias, and carry-over effects. As suggested by the Cochrane Handbook, studies with low methodological quality (i.e., rated ‘high risk’ across multiple domains) were not removed immediately. The two assessors discussed and reevaluated the potential effects of these biases. It was decided that none of the studies would be removed from the systematic review as the information in the eligible studies could provide relevant and substantial evidence to the present study’s research questions.

Data extraction and synthesis

Two independent reviewers extracted data from the included articles via a data extraction form developed for the systematic review. Each reviewer extracted the following information from all the articles: (a) the methodological design of each study, (b) the social media independent variable(s), (c) different types of prosocial behavior exhibited in a natural setting(s), and (d) the underlying psychological mechanism explaining the effects of the various social media influences on a variety of prosocial behavior.

The reviewers then collectively assessed the extracted findings and analyzed the data based on a narrative synthesis, wherein the similarities and differences from the findings of the ten studies were explored. The following steps were used to conduct the synthesis: (a) consolidating the specific variables on social media platforms that influence various prosocial behavior; (b) considering their underlying psychological mechanism of influence; (c) exploring relationships in the data and assessing the robustness of the synthesis (Higgins et al., 2019; Popay et al., 2006); and (d) addressing possible limitations and research gaps. The patterns in the extracted data are identified in the following subsections.

Results

Figure 3 presents a PRISMA flow diagram of articles included and excluded in this systematic review. The review search identified 21,772 titles after duplicates were removed; 21,746 articles from the search result were excluded after the title and abstract screening. 17 articles were further excluded after the full text of the remaining articles was assessed based on the present study’s eligibility criteria. The full-text methodological quality assessment resulted in nine articles being eligible for data extraction and narrative synthesis.

Descriptive statistics

In general, the studies reviewed in this paper recruited participants who were deemed as emerging adults (i.e., 18 to 35 years old) at the time of their participation in the studies. Three of these studies (i.e., Chou et al., 2020; Myrick, 2017; Weber et al., 2020) did not specify their target population but focused on participants within the emerging adult age range. These participants were also users of social networking sites (e.g., Facebook, Weibo, Blog) or charity websites (e.g., GoFundMe).

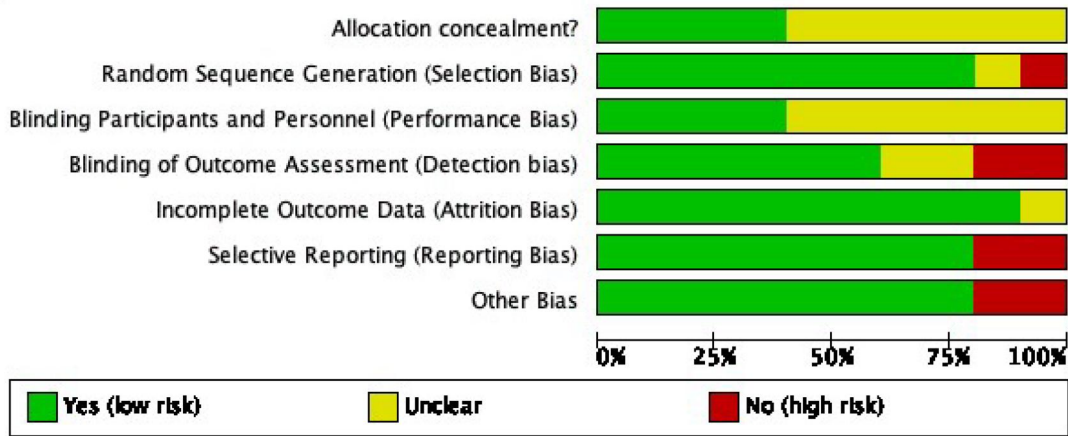


Figure 1. Risk of bias graph.



Figure 2. Risk of bias summary.

Of the nine studies, 7 were quantitative studies consisting of experimental ($n=5$) and correlational ($n=2$) designs with a total of 2,379 participants where the minimum sample size is $n=114$ and the maximum sample size is $n=810$. These participants were recruited mainly from a worldwide crowdsourcing website (i.e., Amazon Mechanical Turk), while the rest were undergraduates or national samples from Canada, Germany, Taiwan, and the United States of America. Secondly, there were two qualitative studies which consisted of content analyses ($n=2$) of 1,739 social media posts (e.g., Weibo, Blog). The overview of the studies (e.g., aims, independent and dependent variables, study design, and summary of findings) is presented in the Appendix.

Social media variables

A total of four key social media factors were identified in the included studies. Three factors involved using the content of the social media posts or comments while one factor included the type of information used to influence users' behavior.

The Importance of the number of "likes" and comments

One qualitative study highlighted the importance of the number of "likes" and comments a social media post had when individuals viewed a post. Participants felt empowered when they saw a post with many "likes", and they would subsequently view the

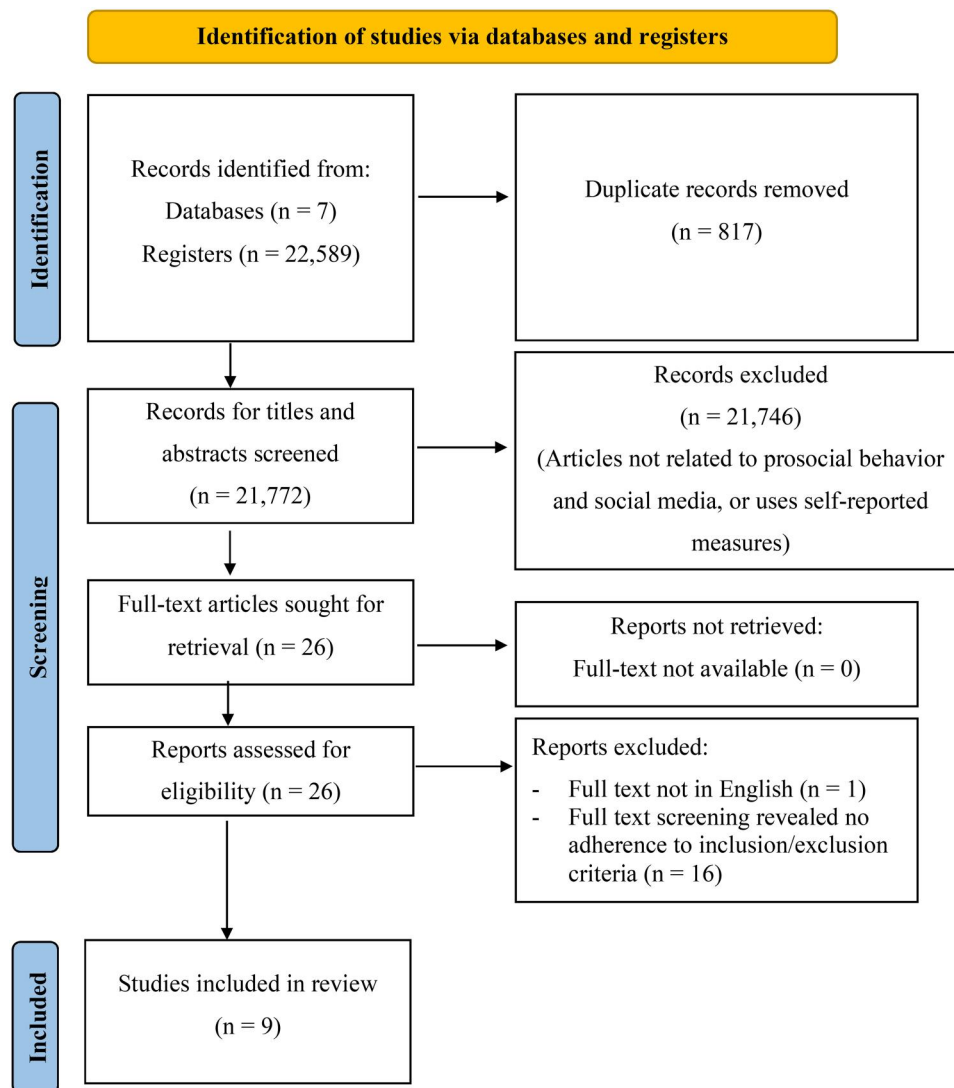


Figure 3. PRISMA flow diagram.

comments out of curiosity where their opinions, judgments, and attitudes would be affected by what is stated in the comments (Wheeler & Quinn, 2017). Additionally, the opportunity to view multiple perspectives ('Perspective Taking' theme) through the comments allowed social media users to relate to the topic ('Relatability' theme) and feel part of a community (use of the word "we" in the 'Prosocial action' theme). Therefore, this study revealed that if the post or comments discussed prosocial acts, individuals would manifest prosocial behavior related to the post or comments that they had viewed.

Implication of stereotypical messages

One quantitative experimental study revealed that stereotypical comments could prime ingroup and outgroup differentiation that would reduce people's prosocial behavior instead (Weber et al., 2020). Hateful

comment(s) was found to activate negative implicit attitudes toward an outgroup while negative-civil comment activated negative explicit attitudes. Both types of comments resulted in an indirect decrease in donations to the outgroup.

Emotional valence of the social media content

Three of the included studies reported that the emotional valence of the topic in social media posts influenced emerging adults' prosocial behavior. Affective reactions have been demonstrated to appeal to the 'heart' where either positive or negative affect (e.g., empathetic concerns, personal distress, surprise, anger, and hopefulness) induced by smiling donor recipients or disheartening information about refugees has increased prosocial acts (Myrick, 2017; Paulin et al., 2014; Wheeler & Quinn, 2017).

Accessible and relevant information

Three studies revealed that providing audiences with statistical descriptions of organ donation (Jiang et al., 2019), or information about the recipient of the prosocial action (e.g., last name or identity of the recipient; Sisco & Weber, 2019) could also increase individuals' prosocial behavior.

Behavioral measures of prosocial behavior

The 7 quantitative studies have revealed four methods of measuring observable prosocial behavior exhibited in natural settings: (a) Monetary donations were measured by gathering participants' dichotomous responses ($n=1$; e.g., Yes vs. No) or rating on a scale slider ($n=1$; e.g., the scale of 1 cent to 500 cents) to indicate whether they would like to donate from the participation incentive that was given to them. Alternatively, participants were given the option to donate any amount of their participation incentive by indicating the donation amount in a blank field.

Another method used in these studies was measuring (b) volunteerism ($n=2$) by recording the number of hours one volunteered at a center or the number of data sheets one was willing to code after undergoing the experimental manipulations. Results also revealed that other forms of behavioral measures such as (c) providing one's contact information ($n=1$; e.g., email, mobile number), and (d) online social sharing ($n=2$; e.g., liking/commenting on a post, reposting/sharing a post on one's page, messaging the information of the post to others) were used to measure prosocial behavior in natural settings.

Discussion

The findings of this systematic review provide useful implications to researchers and social service sectors (e.g., charities, special education institutions) who are leveraging social media audiences to garner support and help for their organizations. Theoretical and practical implications of the effects of social media factors on emerging adults' prosocial behavior are outlined below.

Theoretical implication

Firstly, the number of "likes" and comments has been found to influence individuals' prosocial behavior through cognitive biases. The Bandwagon Effect explains that social media users make decisions about joining or not joining online interactions after briefly scanning a page to locate as many signals as possible

(Wang et al., 2015). The signals that users are locating are social media audience metrics such as audience size and opinions (Saxton & Wang, 2013; Waddell & Sundar, 2020). For example, when individuals viewed a social media post that had many "likes" or comments, they perceived the post to have good content quality and deemed it as credible because of the large audience it had garnered (Knobloch-Westerwick et al., 2005; Sundar, 2008). If the social media post's objective was to get the audience to exhibit certain prosocial behavior (e.g., monetary donations), these positive perceptions would then prompt the exhibition of prosocial behavior as individuals equate the presence of large audiences to societal norms that they should adhere to Neubaum and Krämer (2016). People might have made use of this bandwagon heuristic instead of basing their actions on existing evidence because they had limited cognitive capacity (e.g., insufficient time or knowledge on the topic) to guide their decision-making processes (Fu & Sim, 2011). Therefore, the bandwagon heuristics that are triggered by individuals' biased perceptions might have led to the increase in prosocial behavior.

Secondly, although social media posts with many comments could positively influence one's prosocial behavior, the presence of stereotypical comments had a negative effect on people's prosociality toward an outgroup instead. Hateful and negative-civil comments about an outgroup primed intergroup biases that caused an indirect effect in reducing people's donations to the outgroup (Weber et al., 2020). According to Arendt et al. (2015), hateful comments are an obstructive stimulus (i.e., socially unacceptable behavior) that aroused more attention and emotional response than negative-civil comments. This arousal brought negative attitudinal effects to individuals' conscious cognitive processes that caused them to be consciously aware that it is wrong to have these thoughts (roskos-Ewoldsen et al., 2007). Therefore, individuals felt compelled to employ cognitive corrective actions to reduce these socially unacceptable explicit attitudes. However, the hateful comments also activated negative implicit attitudes which the conscious, cognitive counterstrategies had limited effects on. Individuals are not aware of the unconscious and automatic processing of these stereotypical messages, thus, their inability to control their subsequent antisocial behavior toward the outgroup (i.e., reduced prosocial actions; Gawronski & Bodenhausen, 2006).

Similarly, the presence of negative-civil comments also resulted in a decrease in prosociality toward an outgroup. However, its effects stemmed from the

activation of explicit attitudes instead of implicit attitudes because these negative-civil comments were not influential enough to activate the latter (Weber et al., 2020). Negative-civil comments were perceived to be approved by others, thus the negative attitudes generated from these comments did not arouse enough attention and emotional response to be brought to one's conscious mind (roskos-Ewoldsen et al., 2007; Winter et al., 2015). Consequently, cognitive corrective actions were not employed to reduce these explicit negative attitudes, which caused individuals to hold back their prosocial actions toward outgroup members (Hsueh et al., 2015). Therefore, from a political perspective, online civil criticism can be detrimental to democratic societies as it has been shown to cause less social cohesion and more intergroup solidarity (Domingo, 2011). Solely focusing on incivility and outright hate speech might not be sufficient in curbing potential threats of online user comments, especially when negative-civil statements are not restricted or deleted from social media platforms as they are deemed socially acceptable (Ziegele & Quiring, 2017).

Several researchers have discussed solutions to curb the implication of stereotypical messages by involving an active community to be engaged in counter-narratives to the stereotypical messages, which would provide various perspectives for social media users to process (e.g., Braddock & Horgan, 2016; Macnair & Frank, 2017; Ziegele et al., 2019; Ziegele & Jost, 2016). For instance, social media platform features such as content moderation algorithms and community guidelines enforcement may influence user interactions and shape the impact of stereotypical comments on prosocial behavior toward an outgroup. Content moderation algorithms can be designed using natural language processing techniques to detect and filter out stereotypical and harmful contents in user generated posts or comments, thus allowing social media platforms to proactively remove or flag such negative content before they are made visible to other users (Fu et al., 2020). Social media platforms can also enforce community guidelines that explicitly prohibit hate speech, discrimination, or other forms of harmful content, whereby action can be taken against users who violate the guidelines (Gillespie, 2018). The "report" and "block" functions that are currently embedded in most social media platforms can also be effective in mitigating the effects of the negative content by urging the online community to help flag stereotypical and negative content based on these guidelines (Ragnedda & Muschert, 2017). Alternatively, incorporating prosocial media content to counteract the negative

impact of stereotypical comments on social media platforms can also serve as an effective strategy. Greitemeyer (2009, 2011) emphasized the influence of media content on social behavior, indicating that exposure to prosocial media content (i.e., messages, images or videos that promote kindness, cooperation, or positive community engagement) can lead to more positive outcomes and reduce antisocial behaviors. Similarly, prosocial media content has been found to have a significant influence on prosocial behavior toward strangers, helping, and prosocial thinking because the social media platforms was able to establish an environment that fosters positive attitudes which subsequently promoted prosocial behaviors even in the presence of stereotypical comments (Coyne et al., 2018).

Lastly, the emotional valence of social media content has demonstrated its appeal to the 'heart' where either positive or negative affect induced by the topic has increased prosocial acts (Wheeler & Quinn, 2017). The mood-behavior model (Gendolla, 2000) posits that affective reactions affect behavioral preferences based on an individual's hedonic motive. For instance, people are driven by their willingness to move toward a pleasurable goal or away from a threat. Therefore, in a situation where individuals are experiencing a positive emotion or facing a threat that could potentially affect their positive emotion(s), they are willing to maintain this positive mood by acting prosocially (Hudson, 2013; Sanders & Tamma, 2015). Similarly, the Macbeth effect describes that negative affect induced by social media post(s) causes personal distress (e.g., feelings of guilt, sadness, anger, fear) which people would want to eradicate to make themselves feel better (Zhong & Liljenquist, 2006). For example, when people see that their ethical standards have been threatened (e.g., perceiving themselves to be more fortunate than others in certain aspects of their lives), they would want to exhibit behavior that reduces these negative feelings of guilt (Basil et al., 2007; Xu et al., 2014). Therefore, from a social service perspective, inducing either positive or negative emotions through social media platform(s) can increase prosocial behavior as individuals are subsequently motivated to maintain their positive mood or to reduce unpleasant feelings, respectively.

However, other studies have also found that inducing both emotional reactions at the same time (i.e., mixed affect) did not have any effect on prosocial behavior (Slattery et al., 2021). Concurrently inducing both emotional reactions required dual cognitive processes (Liang et al., 2014). Moreover, positive and negative emotions are conflicting emotions that cause

cognitive dissonance among emerging adults (Williams & Aaker, 2002). The need to cognitively process two emotions while managing the discomfort caused by it requires more effort. This leaves limited cognitive capacity for people to employ decision-making processes to exhibit prosocial behavior (Bennett, 2016). Therefore, it is also important to consider that individuals are incapable of deciding what actions to take to relieve themselves from the unpleasantness of processing two conflicting emotions, and thus there is a need to avoid inducing both positive and negative emotional on social media platform(s).

Practical implications

The Design and content of social media platform(s)

This systematic review also revealed that providing social media audiences with accessible and relevant information about donations to the organization would also increase prosocial behavior toward that organization (Jiang et al., 2019; Sisco & Weber, 2019). Allowing people to access such information might have activated thoughts on commonly adopted prosocial behavior which subsequently motivated them to act prosocially (Cialdini et al., 1990; Raihani & McAuliffe, 2014). This motivation could have emerged from individuals' inclination to conform to and engage in injunctive social norms (i.e., behaviors that one is expected to follow in a given situation; Yanovitzky & Stryker, 2001). Therefore, reputational concerns about being socially disapproved or punished would drive people to exhibit prosocial behavior to present themselves in a favorable light (Cappellari et al., 2011; Powell et al., 2012). In addition, providing specific information about the recipient(s) of the prosocial act also increased prosociality. When people see the direct effect of their prosocial behavior (e.g., who, what, where their actions are benefitting), it increases their self-efficacy which leads to their subsequent prosocial behavior toward the recipient(s) (Kogut & Ritov, 2005; Small & Loewenstein, 2003). Hence, social service sectors should ensure that their social media platform(s) contain important information about social norms on giving, as well as details about the recipients of their organization's work, to effectively increase emerging adults' prosocial behavior.

Behavioral measures of prosocial behavior

The studies analyzed in this systematic review have revealed four observable methods of measuring prosocial behavior, which can be used in future experimental investigations to determine people's actual

prosociality. Firstly, monetary donations have been used to measure one's prosocial behavior (Lane & Dal Cin, 2018; Sisco & Weber, 2019). Experimental investigations can give participants monetary remuneration for their participation in the study and subsequently ask them to donate it. Asking participants to donate using their participation earnings would ensure that people's decision to donate is not affected by their social economic status and is driven by the social media factor(s) instead (Juanchich et al., 2019; Slattery et al., 2021; Weber et al., 2020). Dichotomous responses (e.g., Yes vs. No, Give vs. Keep), a scale slider rating the donation amount people would like to donate (e.g., the scale of 1 cent to 500 cents), or an open-ended field where participants indicate an amount are some observable methods to reflect the exhibition of prosocial behavior. Therefore, future experimental investigations could ask individuals to donate their remuneration after participating in the study to determine if their prosociality has been influenced. However, such monetary donations might be driven by other extrinsic motivators instead of a direct influence from social media factor(s). For instance, some countries allow donors to be entitled to tax rebates or reductions in income tax payments (Ariely et al., 2009). This is where individuals utilize a cost-benefit analysis to determine if it is self-beneficial to make monetary donations. As such, future studies will need to consider controlling this extraneous variable or include it as a mediator in the experimental framework.

Another measurement method was asking participants to sacrifice their time through volunteerism. Studies have requested participants to leave their contact information if they were willing to participate in another study, help analyze data, or volunteer in a home (Chiou et al., 2014). The studies which used this method of measurement have ensured that other motivators (e.g., gaining school credits, part of completing one's coursework, mandated by employers, or claiming time off from work) did not affect the true representation of one's prosocial behavior, where participants were not undergraduates, and the studies did not have a relationship with participants' employers. However, leaving one's contact information does not equate to the exhibition of the actual prosocial behavior as studies must ensure that participants do turn up for the event to confirm that their prosociality has been influenced (Chou et al., 2020). Individuals could leave their contact information but not respond to the subsequent prosocial request, thus not truly reflecting their prosocial behavior. Future studies could get

participants to immediately participate in another unrelated activity to determine if they have truly exhibited prosocial behavior.

Lastly, online social sharing about a prosocial topic or request was also used to measure one's prosociality. Individuals were deemed as exhibiting prosocial behavior when they shared a social media post about homeless people or cancer-related topics (Myrick, 2017; Paulin et al., 2014). Despite its intention to spread awareness about prosociality, it is imperative to cautiously use online social sharing as a form of prosocial behavioral measure because it fundamentally does not fit into the definition of what prosocial behavior entails. Prosocial behavior describes a broad class of voluntary actions intended to benefit others (Batson, 1991; Carlo et al., 2010; Eisenberg et al., 2006). Therefore, sharing information online does not directly benefit others who require direct help (e.g., donation, sacrificing one's time to volunteer) but it is a form of slacktivism (i.e., action requires little effort or cost) which might cause people to perceive that they have contributed without doing anything meaningful on their end (Chou et al., 2020).

On the other hand, some theorists have found an alternative explanation and positive effect of online social sharing on the subsequent exhibition of prosocial behavior. The social cognitive theory has been widely adopted in social networking studies to examine the motivational factors that drive people to partake in information sharing in virtual communities (Chiu et al., 2006; Kim & Yang, 2017). It posits that being an advocate online is a precursor to an exhibition of prosocial action (Bandura, 1986; Freedman & Fraser, 1966). This indirect effect describes that online social sharing acts as a mental rehearsal for individuals to think about behaving prosocially before demonstrating an actual prosocial action that would benefit others (Myrick, 2017). Moreover, impression management theory describes that people might feel compelled to follow through with what they have shared online (i.e., reputational concerns) by exhibiting the prosocial behavior associated with the social media post (Halupka, 2014; Hu, 2014). People are aware of how they appear to others when they share the post (i.e., observability), thus activating thoughts about how they should act to be consistent with their "online self" (Guadagno & Cialdini, 2010; Lane & Dal Cin, 2018). This heightened sense of self drives people to act prosocially to reduce their cognitive dissonance about being a "hypocrite" (i.e., displaying themselves as prosocial online but not exhibiting any prosocial behavior; Myrick, 2017).

In addition, the theory of planned behavior (TPB) has been applied to the prediction of various prosocial behaviors (e.g., blood donation and volunteering) in past literature, which could also explain the crucial role that attitudes and subjective norms about online social sharing play in individuals' decisions to act prosocially at a later stage. For example, individuals may engage in cognitive processes such as deciding to use "likes", shares and comments for prosocial purposes (e.g., increase the visibility and outreach of the social media post), or considering their beliefs and attitudes about the potential impact of the prosocial behavior requested in the social media post (Alhabash et al., 2015; Usmani et al., 2019). Based on the TPB, this interplay between one's attitudes about the said prosocial behavior and their exhibition of online social sharing could influence their intention and likelihood to engage in the said prosocial behavior thereafter (Xie & Zhang, 2022). Similarly, when the individual perceives that further "likes", shares and comments from their online peers indicate support and value from their social networks (i.e., subjective norms), they are more likely to engage in subsequent prosocial behavior because the act of receiving likes, shares, or comments can evoke emotional processes such as validation, happiness, or gratitude (Labroo et al., 2022; Smith & McSweeney, 2007).

Therefore, given the mixed findings regarding the use of online social sharing as a behavioral measure for prosocial behavior, future studies can further explore and confirm the effect of online social sharing on prosocial behavior, or its relevance as a subset of prosocial behavior. Research on potential strategies to increase online social sharing and boost people's subsequent prosocial behavior should also be considered. Alternatively, future studies can also explore the effects of incorporating online gamification into the prosocial experience where individuals are brought through a virtual "expedition" or can earn virtual tokens when they exhibit online social sharing of other community members' requests for help and perform prosocial behavior (e.g., helping someone with data cleaning or free online tutoring) thereafter (Naqvi et al., 2021). From a social service perspective, organizations should then consider asking individuals to share their messages on social media platform(s) before directing a prosocial request to them.

Limitations and future studies

The results presented in this systematic review must be considered alongside their limitations. Future studies to

improve this systematic review or address current gaps in the literature are also discussed in this section.

Firstly, the search strategy developed to retrieve relevant research from various databases yielded 21,772 titles. This reflected the possibility that the keywords used in the search strategy might have been too abstract or broad such that they cover a wide range of topics related to social media and prosocial behavior. The reviewers initially decided to include synonyms of prosocial behavior and social media to ensure that all related articles were collected during the search. However, many of the yielded titles did not use social media as an independent variable or prosocial behavior was measured using self-reported questionnaires. To possibly resolve this limitation, future systematic reviews could include a keyword in the search strategy that might only yield research that used behavioral measures of prosocial behavior. Although the search strategy has caused the researchers of this systematic review to screen many irrelevant and ineligible articles, this has demonstrated and confirmed that there is a lack of empirical evidence on the effect of social media on prosocial behavior and that studies mostly utilized self-reported measures. Therefore, there is a need for more experimental investigations of social media influences on prosocial behavior which observe people's exhibition of prosocial behavior instead of their prosocial intentions.

Secondly, the studies reviewed here only explored some social media platforms (e.g., GoFundMe, Facebook, Weibo) that currently might not be as popular as when the studies were conducted. A reassessment and investigation of the most visited social media platform(s) should be done to ensure that the results are generalizable to the current target population (i.e., emerging adults) from the year 2022 onwards. In addition, further research into different and more types of social media platforms could provide valuable insights into how the platform affordances (i.e., features, functionalities, and design elements that are inherent to a particular social media platform) could shape users' interactions and exhibition of prosocial behavior differently. For instance, the visual nature of Instagram allows users to creatively express themselves and showcase acts of kindness through images and videos, which could potentially increase the visibility and impact of prosocial actions (Hou et al., 2019). On discussion forums or platforms like Reddit, where anonymity is an option, users may feel more comfortable engaging in prosocial behaviors without the fear of judgment or social repercussions (Zhao & Zhou, 2020). In a different psychological mechanism, community-driven platforms such as Twitch or

Discord can foster a sense of belonging and collective support among users which can enhance prosocial behaviors within the platform's community (Karim et al., 2020). Therefore, by understanding how these unique features influence user interactions and behaviors, future studies should explore and identify separate strategies to promote and encourage positive social interactions and prosocial behaviors among users in different types of virtual communities.

Future studies should also examine the role of gender in moderating prosocial behavior. Paulin et al. (2014) revealed that when males and females viewed social media posts about charity events, females generally demonstrated more prosocial behavior than males. Males required more emotional prodding (e.g., affective advertising) from social media post(s) to sufficiently arouse their empathy levels and increase their subsequent exhibition of prosocial behavior. Sisco and Weber (2019) also showed that males made more online donations under visible circumstances to attract the opposite sex or for social comparison purposes. Therefore, females and males differ in their inherent predispositions (e.g., empathy levels, charitable, egocentric) and underlying motivation to act prosocially, which should be investigated or controlled for in the experimental frameworks of future studies. Researchers should also examine the underlying psychological mechanism that drives males to act more prosocially after being emotionally aroused as current literature did not address the cognitive processes behind their findings (e.g., Paulin et al., 2014).

Moreover, individuals differ in their social media usage, interest, or passion for different social topics, and personalities. This fundamental difference might have caused some people to act prosocially toward certain social causes but not to those which they do not relate to. Hence, pre-demographic tests could be administered to participants to determine baseline differences among participants while post-tests would help to ascertain if social media factors have affected these disposition(s) and influenced their prosocial behavior thereafter. In addition to the differences in interests and personalities, the age range in which emerging adults have been defined is also relatively wide (i.e., 17 years difference from the youngest in the age range as compared to the oldest in the same age range). The older emerging adults may have preferred social media platforms with more text-based information sharing while the younger emerging adults could be more attracted to social media platforms which uses more visual information (Lupton, 2021). This individual difference in preference for

social media platforms may provide insights into how different social media factors would influence different online personas, which is a potential area of research for future studies.

Lastly, some studies in this systematic review used undergraduates as their sample. Although undergraduates fall within the age range of emerging adults, they might not be a true representation of the target population when measuring people's donating behavior. This lack of generalization is because not all undergraduates have the financial capabilities to exhibit this prosocial behavior. Additionally, when measuring working adults' exhibition of volunteering behavior, they might not act prosocially as they might not have the time to do so. Therefore, future studies should investigate the underlying personal reason(s) behind people's prosocial decisions or the impact of individuals' stages of life (e.g., working, schooling, family situation, socio-economic status) on their prosocial behavior.

Conclusion

In summary, designers of social media platforms or posts should ensure that there are comment sections to facilitate discussion as it would help to increase the number of comments. Organizations posting about prosocial pleas or sharing about any prosocial situation should also find ways to boost audience metrics where people would be more inclined to "like" a post (Wang et al., 2015). One method to possibly increase "likes" is to utilize esthetically pleasing, usable, and accessible social media platform(s) that would create positive experiences amongst users and boost the exhibition of prosocial behavior to prosocial pleas (Hudson, 2013; Sanders & Tamma, 2015). This presence of large audience metrics could lead to an increase in prosocial behavior toward the cause thereafter (Knobloch-Westerwick et al., 2005; Sundar et al., 2008).

Although a post with many comments might cause people to perceive the organization's quality and credibility which increases prosociality, it is crucial to ensure that there is a moderator or an active online community to sieve out hateful and negative-civil comments about the topic. The presence of such negative comments without any counterargument to address the issue could sway individuals in the opposite direction and reduce prosocial behavior concerning the prosocial post (Weber et al., 2020). Therefore, the organization will need to actively partake in online discussions to remove negative comments or provide alternative perspectives to boost prosociality toward their cause (Wheeler & Quinn, 2017).

In addition, the information provided in the post(s) should contain clear, simplified messages that include relevant information about the topic (e.g., statistics about recent donations, recipient of the prosocial act, and social norms of charitable giving; Jiang et al., 2019; Sisco & Weber, 2019). It would also be effective if the content of the post(s) contains emotional valence that triggers positive or negative emotions amongst emerging adults. Such emotional experiences could motivate people to act prosocially as they attempt to maintain their positive mood or reduce negative feelings, respectively (Basil et al., 2007; Wheeler & Quinn, 2017; Xu et al., 2014; Zhong & Liljenquist, 2006). For example, a charity organization could post a picture of a child with disabilities to invoke negative emotions, while stating how much the child needs for medical fees, how much has been currently donated, and the procedure for donating. Therefore, the social service sectors who are aiming to garner more prosociality from people should employ these techniques in their social media platform(s) to effectively increase users' prosocial behavior.

Common prosocial behavior that is exhibited as a result of these social media factors includes monetary donations, volunteerism, and online social sharing (e.g., reposting, 'likes', comments). Therefore, future studies or marketing strategists can consider curating social media posts to elicit these prosocial behaviors amongst emerging adults.

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Appendix. Overview of the Studies.

Authors	Aims	Independent Variable	Dependent Variable	Design	Findings & Discussion
Chiou et al., 2014	Investigating if indiscriminate one-to-many/monologue communication will induce egocentrism and reduce the inclination to display prosocial behavior	Sharing conditions: 1. Indiscriminate – Post messages to all Facebook friends 2. Thoughtful – Post messages to those friends who would be interested 3. Control – Asked them to help test a pilot study due to poor internet connection	Observable behavior: Volunteerism • Provide contact information for reference: Volunteerism • Indicate how many data sheets they are willing to code (5 minutes per sheet) Sarcasm Attribution • 7 point Likert Scale • 1 = “very sincere,” 7 = “very sarcastic”	Quantitative Study 3 × 1 between Subjects	Indiscriminate group significantly volunteered to help code fewer data sheets and demonstrated more sarcastic attribution than the other 2 conditions • Enactment of monologue communication can undermine prosocial tendencies and increase egocentric state Sarcastic attribution (lack of perspective taking) also mediated the effect of indiscriminate monologue communication on volunteerism • Engaging in monologue communication may activate a behavioral representation of an egocentric self-focus, which reduces the likelihood of perspective taking and prosocial behavior Public Self-awareness theory • Combined self-other initials e-pledge volunteered more than the other 2 conditions • People first generate their own standard when thinking about self and others • They then measure their subsequent behavior by the standard they have just created • This heightened sense of self-regard would compel them to follow through with the e-pledge Significant-other transference • Combined self-other initials e-pledge helped participants to dedicate the pledge to the person • Enhanced commitment Descriptive Social Norms • Statistical descriptions of organ donation has the highest repost/post ratio, comment/post ratio, prodonation/comment ratio and intention/comment ratio • Activate people’s thoughts on commonly adopted behaviors Injunctive Social Norms • Meaningfulness of organ donation also generated a significant amount of donation intentions • Behaviors people think they ought to exhibit
Chou et al., 2020	Shed light on how to effectively transform virtual acknowledgment into a deeper commitment, and eventually action. • Developing an intervention that addresses slacktivism related to e-pledging • Generate flexible and improve e-pledging methods	E-pledging condition: 1. Clicking on “Like” 2. Typing their initials 3. Combined self-other initials e-pledge	Observable behavior: Volunteering Logs of volunteer hours from the program directors	Quantitative Study 3 × 1 between subjects	
Jiang et al., 2019	Analysing media posts regarding organ donation on Weibo to identify the media themes that are most advantageous in promoting public awareness and attitudes concerning organ donation. Suggest the potential of campaigns on social media for promoting prosocial health behaviors and highlight the importance of strategic message design for serving this goal	–	Themes 1. Organ donation behaviors 2. Issues and policies regarding organ donation 3. Meaningfulness of organ donation for Donors, Recipients and Society 4. Statistical descriptions of organ donation 5. Organ donation practice	Qualitative Study Content Analysis	

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Appendix. Continued.

Authors	Aims	Independent Variable	Dependent Variable	Design	Findings & Discussion
Lane & Dal Cin, 2018)	Examining youth's media sharing on social networking sites Test the effect of publicly vs. anonymously sharing a social cause video on subsequent willingness to engage in offline helping behavior.	2 conditions: 1. Anonymous sharing on a third-party's Facebook wall 2. Public sharing a video publicly on their own Facebook wall	Observable behavior: Online social sharing (evident from conditions) Other variables/measurements for reference: Willingness to volunteer 6 point Likert scale Donation behavior YES/NO YES > slider scale 0 to 50 Additional online and offline helping behavior 6-point scale 4 items each Impression management motive 7 point Likert scale 6 items Affect 6 point semantic differential scale 6 items	Quantitative Study 2 × 1 between subjects	<ul style="list-style-type: none"> Specifically, addressing social meaningfulness could have further activate people's motivations to donate Induce thoughts of death Organ donation behaviors had the lowest comment/post ratio, prodonation/comment ration, and donation/comment ratio Focus on the deceased organ donor instead of organ recipient could have reduced motivations to donate Should focus on recipients which invokes thoughts of saving lives <p>Observability</p> <ul style="list-style-type: none"> Sharing publicly presents a desired image which would increase prosocial behavior to drive people to maintain self-consistency (Willingness to volunteer higher for those who posted publicly) Close the gaps between internal moral and external social pressure to remain consistent with their statement of support More prevalent for people who do not regularly engage with social issues online (Effect of sharing is moderated by participants' social media usage in prosocial activity where participants who do not regularly engage in social causes online will volunteer more in the public sharing condition)
Myrick, 2017	To better understand how the public shared news and reactions with others Investigating if social sharing impacted prosocial cancer-related behaviors (e.g., donating, volunteering, talking to others about cancer research).	Identification 5 items 11-point scale Total score divided by five to form an index Emotional Reactions 15 words 5 subscales Sadness, Surprise, Anger, Anxiety, Hope 11-point scale Total score for each subscale divided by five to form an index	Participants' indicate completion of behavior: Prosocial Behavior Indicate which four actions related to cancer were completed Yes = 1, No = 0 Adding the total for an index Social Sharing Indicate which 9 types of actions were completed Yes = 1, No = 0 Adding the total for an index	Quantitative Study Correlation	<p>Emotional Arousal</p> <ul style="list-style-type: none"> Surprise and anger increased social sharing Identification to cancer or celebrity Increased likelihood of sharing Indirect Effect Possibility of invoking an intense emotional arousal (surprise and anger) which lead to social sharing could subsequently influence prosocial behavior since social sharing significantly predicted prosocial behavior Public image/ Impression management: Do not want to feel inconsistent after socially sharing information (Cognitive dissonance)

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Appendix. Continued.

Authors	Aims	Independent Variable	Dependent Variable	Design	Findings & Discussion
Paulin et al., 2014	<p>Investigating gender differences of Millennials' online and offline prosocial intentions to support charitable events</p> <ul style="list-style-type: none"> • After exposure to Facebook appeals to self-benefit and others-benefit (Egoistic and altruistic motivation as a highly relevant situational factor) • Empathy identification with the cause (Relates to the context of a particular charitable cause) • Social-oriented moral identity (Facet of the self-concept) <p>This framework intimately links the influence of emotions to outcomes from prosocial decisions to support charitable events.</p>	<p>Facebook private event page appeal based on:</p> <ol style="list-style-type: none"> 1. A self-benefit 2. Other's-benefit 	<p>Participants' indicate completion of behavior: Indicate which online and offline behaviors they actually engaged in Other variables/measurements for reference: Online/Offline Intentions</p> <ul style="list-style-type: none"> • 5 point Likert Scale • 4 items each <p>Empathy Identification</p> <ul style="list-style-type: none"> • 5 point Likert Scale • 4 items 	<p>Quantitative Study 2 × 1 between subjects</p>	<ul style="list-style-type: none"> • Social Cognitive Theory: Posits that practicing being an advocate on social media (mental rehearsal) is a precursor to prosocial behavior (action) <p>Gender and type of events influences on prosocial behavior</p> <ul style="list-style-type: none"> • Women tend to be more empathetic, altruistic and moral than men • Females have higher intentions to support the event for both conditions (self-benefit for breast cancer, others-benefit for homeless) • Females demonstrated more empathy identification for the breast cancer event but generally had higher intentions to support event for both conditions <p>Males demonstrated more volunteering when emotionally prodded by altruism, empathy toward the cause, and social-oriented morality</p> <ul style="list-style-type: none"> • Emotional advertising arousal • Creating more emotional relevance to men • Symbolization moral identity predicted online intentions for males
Sisco & Weber, 2019	<p>Analysing donations made on GoFundMe platform to investigate:</p> <ul style="list-style-type: none"> • Human altruism (anonymous vs public donation, kin selection, reciprocity, sexual selection) • Gender differences (giving to different gender, social comparison, costly signal – presence of females at the time of donation, expressing empathy) 	<p>Hypothesis 1: • Altruism (Public vs. Anonymous donation)</p> <p>Hypotheses 2 to 5: • Giving to family members (manipulation of surname)</p> <p>Gender (indicating recipients' gender)</p> <ul style="list-style-type: none"> • Costly signal (visibility of female donors on the website) • Mean visible donation 	<p>Observable behavior: Hypotheses 2 to 5: Donation Amount</p> <p>Other variables/measurements for reference: Hypothesis 1: • Anonymity • Motivations</p>	<p>Quantitative Study Correlation</p>	<p>Hypothesis 1: Motivation</p> <ul style="list-style-type: none"> • 89% of survey respondents indicated at least one egoistic motivations including reciprocity, signal-burying, self-rewards, avoiding self-punishments, tax incentives, and direct benefits • 53% indicated main motivation is that recipient needed help <p>Observability</p> <ul style="list-style-type: none"> • Donations were higher for those who donated publicly versus anonymously <p>Hypotheses 2 to 5: Kin Selection</p> <ul style="list-style-type: none"> • Small percentage of the people gave more to others with the same last name • Activation of Social Norms • Recipient's Gender Differences • Female recipients received more donations (non-significant) • Costly Signal • Donating more under visible circumstances to attract the opposite sex <p>Social Comparison</p> <ul style="list-style-type: none"> • Displaying information of large recent donations influence men to donate more

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Appendix. Continued.

Authors	Aims	Independent Variable	Dependent Variable	Design	Findings & Discussion
Weber et al., 2020	Investigating whether hate, or even civil negativity in user comments alone, inhibit actual prosocial behavior through recipients' explicit and implicit attitudes.	Mock news online articles with the first user comment addressing refugees in a: 1. Hateful 2. Negative-civil 3. Neutral manner	Observable behavior: Donating incentive • Sliding scale 1 cent to 500 cents Other variables/measurements for reference: Pre-manipulation <i>explicit</i> attitudes • 7 point Likert scale • Five statements representing explicit resentment toward refugees Post-manipulation <i>implicit</i> attitudes • Implicit Association Test related to refugees • Measures the relative strength of the association between two target concepts (refugees vs. Germans) and pleasant ("good") vs. unpleasant ("bad") attributes Post-manipulation <i>explicit</i> attitudes • 7-point scales • Rate eight pairs of adjectives in relation to refugees	Quantitative Study 2 × 1 between subjects	Ingroup/Outgroup differentiation • Stereotypical messages activates/reinforces negative attitudes which in turns influence prosocial behavior toward the outgroup (even with civil messages) • Hateful comments had significantly more effect on implicit attitudes than negative-civil • Negative-civil comments resulted in significantly more negative explicit attitudes (relative to neutral) • Both explicit and implicit attitudes significantly impacted donation (significant indirect effect of negative-civil comments to prosocial behavior via explicit attitude) • Hateful comments resulted only in significantly more negative implicit attitudes (significant indirect effect of hateful comments to prosocial behavior via implicit attitude) Why did civil comments activate negative explicit attitudes, but hateful comments activate implicit attitudes? • Uses different cognitive processes • Priming effects (obstructive vs unobstructive stimulus) aroused different levels of attention and emotional responses • Participants consciously using cognitive corrective actions to correct the hateful messages which helps to reduce negative explicit attitudes • Civil comments did not arouse enough attention and is subjected less social sanctioning
Wheeler & Quinn, 2017	Examining how empathy is expressed through interactions on a popular social media blog Motivate people to engage in behaviors and support policies that provides basic social foundations	Vidal Case Study: • Middle school-aged African American boy from a high poverty area of New York • Posts and pictures that captured the main storyline: Vidal's family and their eventual meeting with the President	Empathy Theme • Based on Davis' (1980; 1983) Interpersonal Reactivity Index (IRI) 1. Perspective taking (ability to see from other's point of view) 2. Fantasy scale (ability to imagine feelings or	Qualitative Study Content Analysis	1. Perspective Taking • Unaware of the lives of others around the globe before the blog • Blog allowed them to feel for others • Change in previously held (negative) biases of lay people in other countries due to missing/skewed information brought by media (e.g., chaos, violence) • Take a new perspective of their own (fortunate) life

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Appendix. Continued.

Authors	Aims	Independent Variable	Dependent Variable	Design	Findings & Discussion
		<ul style="list-style-type: none"> Interactions between Vidal, the owner of the blog and Vidal's teacher UN tour 15 photos spanning 12 countries by the owner of the blog 	<p>concerns for fictitious character)</p> <p>Empathic concern (sympathy for disadvantaged others)</p> <p>Personal distress (self-oriented feelings of personal anxiety)</p>		<ol style="list-style-type: none"> Fantasy Scale Irrelevant Empathic Concern Expression of protectiveness Pity, acknowledge that others were suffering/struggling Longing for the ability to help and comfort others Personal Distress Emotional reactions (angry, frustrated, concern, worry) Physical responses (Sad, distraught, crying, feeling pain)<u>Emergent Themes</u> Relatability (making connection between personal and other's experiences) Relating to family, make connection to outgroup Came from similar environment/born there Use of "I am" Pro-social action (statements that benefit others/calls to action) Call to action (providing info for volunteer or fundraiser) Manifestation of action (donating, offering services) Use of "we" Community appreciation (recognizing and celebrating efforts) Thankful for the blog's unbiased representation, compassion/love from the people, inspiring content, humanizing its subject Anti-empathy (statements against the above) and Rejection of anti-empathy (intolerance of anti-empathy) Use of expletives Blaming subject for their plight Insinuating that the posts are for Public Relation purposes