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A new approach to gratitude interventions in high schools that supports student wellbeing

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ABSTRACT

Adolescents face unprecedented wellbeing challenges, compared to previous generations, and many schools are underprepared to meet these needs. Social emotional learning (SEL) programs help, but could better support moral development. Here we propose a modern approach to gratitude interventions (GI) in schools that addresses critical limitations and provides preliminary results of effectiveness. The GI combines a psychoeducational top-down technique with a bottom-up social-media-app modality that supports the autonomous practice of interpersonal and general gratitude. Compared to students in waitlist/control classes, students in GI classes demonstrated improved outcomes in trait gratitude, mental health, and personal/social wellbeing after 6 weeks. Students' use of the app also demonstrated more grateful personality behaviors and personal engagement. Lastly, we examined the importance of interpersonal gratitude in general and found that expressing thanks contributed to improvements in SEL competencies among waitlist/control students 6 weeks later. Implications for improving character/SEL programs through school GIs are discussed.

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High school students need better character development programs for today's world. With the dawn of the internet and smartphones, the degree of challenge and change adolescents confront today is unprecedented compared to previous generations. Loneliness, depression, and anxiety rates are rising, their sleep and social skills are being compromised, and the path to adulthood is longer, more competitive, and more uncertain than ever (Twenge, 2017). Unfortunately, in the U.S. many schools are under-resourced and underprepared to address basic mental health needs, according to the American Civil Liberties Union (Mann et al., 2019).

The new field of Positive Education is ushering in research, applications, and advocacy resources on the science of student and school wellbeing (White & Kern, 2018), however, and character education is resurging through social emotional learning (SEL) programs that better support teaching and learning today. For example, the Collaborative for Social and Emotional Learning provides a systemic framework for delivering five core competencies to help students and school communities thrive: self-awareness, self-management, social awareness, relationship skills, and

responsible decision-making (Social and Emotional Learning Competencies, 2017).

High-quality SEL programs in K-12 schools significantly improve social and emotional skills, attitudes, behavior, and academic performance (Durlak et al., 2011; Jaynes, 2019). But experts think programs could strengthen students' prosocial/moral development by fostering caring relationships and school community more (Meindl et al., 2018). Therefore, this article proposes an effective way to do gratitude interventions (GIs) in high school that emphasizes these practices. Our aims are to:

- assess the state of the field and address the missing critical ingredients
- describe this GI approach and present initial research testing it
- and share preliminary findings from research that addresses this and shows broad support of CASEL's competencies

We hope to clarify for scholars, practitioners and educators how gratitude can enhance SEL in high school and provide a way forward for more naturally supporting character development.

How effective are gratitude interventions (GIs)?

Widely considered a virtue of ‘human strength’ historically (Emmons & Crumpler, 2000), gratitude is a character strength most strongly associated with life satisfaction (Park et al., 2004). After Emmons and McCullough (2003) landmark study found that GIs have mental health and wellbeing benefits, interest in gratitude and its applications increased sharply.

Though ample evidence from cross-sectional, longitudinal, and some intervention research links gratitude to less depression and anxiety and more perceived social support and subjective wellbeing among adults and youth (for a review, see Bono & Sender, 2018), recent meta-analyses cast doubt on GI’s effectiveness for promoting gratitude and wellbeing among individuals generally (Davis et al., 2016) and among students specifically (Renshaw & Olinger Steeves, 2016). Davis et al. (2016) evaluated if GIs outperformed measurement-only control or matched-activity conditions. They found a small effect on wellbeing and no effect on gratitude, compared to measurement-only controls and small effects on gratitude and wellbeing, but no effects on anxiety, compared to matched-activity conditions. Because many GI studies did not use pure-control conditions or used self-discipline activities whose effectiveness as comparisons could not be estimated, Davis et al. recommended further research to design better GIs in general.

Renshaw and Olinger Steeves (2016) meta-analyzed 20 studies of gratitude among youth, 5 of which were intervention studies in school settings. In terms of summary effects on indicators of subjective wellbeing (e.g., positive affect, positive outlook, and positive self-appraisal) or of subjective distress (e.g., negative affect, depression, and somatic symptoms), they found that gratitude may be more effective than doing nothing (passive control) among in-school or after-school youth, but not practically different compared to broad positive psychology interventions (active controls) among youth in an alcohol/substance program. In terms of specific outcomes, they found small overall intervention effects on positive affect and happiness against passive controls and concluded that it is unclear if GIs are generally effective or useful for students or schools. Given the paucity of intervention research with youth and the different strategies used, these researchers argued that more intervention research was needed to assess their effectiveness.

How to improve GIs for schools?

Both Davis et al. (2016) and Renshaw and Olinger Steeves (2016) urged researchers to consider more

context-specific effects to strengthen gratitude interventions in schools. This is the first limitation in the field that we address. The other curriculum-based school GI conducted in classrooms was delivered by researchers (Froh et al., 2014). Research indicates that lessons delivered by teachers as part of social emotional learning programs help to improve students’ wellbeing, conduct and academic performance (Durlak et al., 2011). Furthermore, GIs need to improve Person X Activity fit to counter hedonic adaptation and produce stronger, more durable effects (Layous & Lyubomirsky, 2014). Activities should be novel and varied to engage students authentically (Lyubomirsky et al., 2011). For adolescents, interventions that are unresponsive to their needs and the context of their daily lives can provoke reactance (Yeager et al., 2015). Intervention designs often fail to address adolescents’ unique challenges and concerns, and ignoring the psychological seeds of social or personal problems reduces programs’ impacts (Walton, 2014). Our GI lets students choose their practice. They can thank a peer or teacher; write a gratitude journal entry; or reflect on any of these or other experiences for feeling grateful – all as part of the classroom experience.

Second, beyond simply feeling grateful, expressing gratitude to others is particularly potent. Receiving expressions of thanks increases prosocial behavior by making recipients feel socially-valued (Grant & Gino, 2010), and thanking others improves expressers’ relationship-enhancing behaviors and wellbeing (Algoe, 2012; Lambert et al., 2013; Seligman et al., 2005). While these effects with youth remain uncharted empirically, we know that gratitude development throughout the high school years is associated with increases in prosociality and vice-a-versa and that more grateful teens also have more empathy and intentional self-regulation (Bono et al., 2019). This suggests that gratitude supports more constructive behavior personally and socially in development. But expressing thanks to others has figured into only one youth GI (Froh et al., 2009). Moreover, none have produced effects on trait gratitude, let alone identified how to engage youth in authentic gratitude practices organically in their social environments. Harnessing interpersonal gratitude to amplify kindness in social settings should improve GIs.

Recent research, however, finds that individuals have egocentric biases preventing them from expressing thanks (writing gratitude letters) to recipients (Kumar & Epley, 2018). Specifically, expressers underestimate the surprise and positive feelings recipients experience upon receiving a letter, and they overestimate the awkwardness recipients feel – expectations negatively associated with intentions to express gratitude. These are obstacles GIs must address.

Third, in school settings, student peer and adult relationships directly support wellbeing and achievement by creating a sense of community (Wentzel & Ramani, 2016). Increased happiness and lower stress, anxiety, and depression are particularly important for adolescents, who struggle to navigate today's physical, emotional, and social changes (Twenge et al., 2018). The sense of belonging students feel with teachers or adults at school, peers, or with school in general, is critical for succeeding in each of these areas. Adolescents explore and refine multiple identities, and it is important for schools to create 'identity safe' spaces where different social identities are welcomed as assets instead of impediments to combat belonging uncertainty (Steele & Cohn-Vargas, 2013). Though depression and suicide are accelerating fastest for teenagers in the United States lately (Weinberger et al., 2018), school GIs have not addressed students' identity safety. Gratitude, a virtuous moral affect, has yet to be promoted through intervention that incorporates social context effectively. Developmentally, this is disadvantageous. To promote virtuous habits sustained by improved self-regulation, interventions must increase how much target behaviors are perceived as self-relevant and meaningfully connected to something beyond the self (Berkman, Livingston & Kahn, 2017).

To address the above limitations, the current GI uses social media technology as a modality of practice to give students a non-threatening way to practice gratitude more broadly (toward or for people or things), autonomously, and meaningfully within the classroom social context so that they can capitalize on natural sources of social support and experience greater motivation and coherence in their daily life.

Whether social media technology should be used in GIs and how?

One last element relevant to GIs used in modern schools is the integration of technology and social media use. Use of social media has become a ubiquitous phenomenon in the last decade. Today 95% of adolescents ages 13–17 have a smartphone or access to one and 45% indicate being online 'almost constantly' – with social media sites like YouTube, Instagram, Snapchat and Facebook being among the most popular (Anderson & Jiang, 2018). Social media is central to many teenagers' social lives. Could school GIs harness this to be more responsive to their preferences and social interaction habits today? Further, social media use appears to contribute to mental health problems in teens (Twenge,

2017), but the current GI was explicitly designed to be intrinsically motivating, inclusive of diverse students, and identity-safe.

The current gratitude intervention (GI) approach

To address the above limitations and issues, we developed a new, modern GI which included the following four elements:

- (1) Ensure teachers themselves deliver the intervention's broad practices as part of the classroom routine.
- (2) Incorporate an emphasis on expressing thanks (interpersonal gratitude)
- (3) Include familiar modern advancements in the GI, such as social media use.
- (4) Create a broad experience of gratitude that is personally and socially valued within school contexts.

Building on an earlier curriculum that promoted interpersonal gratitude and emotional wellbeing among elementary students – by scaffolding benefit appraisals (Froh et al., 2014) – the GI reported here combines a top-down component (i.e., psychoeducational elucidation of how and why to practice gratitude) and a bottom-up component (i.e., an authentic and engaging modality of practice). The psychoeducational component was a curriculum called *Thanks!: A Strengths-Based Curriculum for Teens and Tweens* that targets grades 6–12 and includes various gratitude practices (i.e., acknowledging each other's signature strengths, gratitude journaling, writing thank you letters to benefactors, and expressing thanks to others). The modality component was a web-app called *GiveThx*, which has thanking and journaling functions that operate like 'social media' in the classroom, but privately, so that students can give and receive thanks with peers and teachers without the competitive or negative social comparisons common in social media.

This dual-component approach has two advantages: it teaches not just strategies but the science of gratitude to furnish students and teachers with reasons for practicing, and it enables users to practice gratitude autonomously so that they could personally experience gratitude's influence on their social interactions with each other by supporting meaning-making from gratitude evidence made visible by the app, fostering metacognitive awareness of self and others. GIs done to date have not nurtured interpersonal gratitude like this. We contend that

fostering genuine interpersonal gratitude practices – organically, as part of the school experience – is key for achieving deeper, more sustainable, gratitude habits.

Social and emotional abilities help individuals adjust to their environment and cope with change, which should improve success throughout life (Chernyshenko et al., 2018). High school is the best last chance for many children to develop deficiencies in these abilities before entering society. Socially and emotionally competent students are more connected with positive peers, less rejected and bullied, and more successful in school (Collaborative for Academic, Social and Emotional Learning, 2007), and feeling connected to school affects their sense of academic competence (Guay et al., 1999).

Thus, our GI addresses critical limitations in the field – and in character education generally. We hypothesized that this GI approach will better impact trait gratitude, mental health, subjective wellbeing, perceived stress and social connection.

Study methods, sample and analyses

Our GI study included 327 students (57% female; $M = 14.72$ years, ages 13–18; 85% Hispanic, 10% Asian, 3% Black, 1% White, 1% Other) in two urban high schools (grades 9–12) during Fall 2017. We used a pretest-posttest quasi-experimental waitlist design to examine the effects of 6 GI classrooms ($N = 152$) against 9 waitlist or control classrooms ($N = 175$) across 2 timepoints (baseline, 6 weeks). Additionally, 6 more classrooms used the app alone ($N = 82$) so that we could examine the GI's effect on app-use (behavioral) data.

The researchers worked with a liaison at the school district (third author) to match classrooms across conditions on grade-levels and content area as much as possible, to decide on the implementation schedule and ensure program fidelity and quality data collection. This design and collaborative method were chosen for practical purposes (e.g., reduce burden on teachers, respect existing routines, and provide optimal analytic comparisons for the research).

Teachers received 300 USD gift-card incentives to participate in a training workshop on the curriculum lessons and research protocol one afternoon, to prepare and deliver lessons, and to collect relevant data. Participants were administered a battery of self-report measures electronically at week 1 and week 6 assessing: students' gratitude; positive and negative affect; prosociality and altruism; depression and general/social anxiety symptoms; quality of relationships with teachers and others generally; perceived stress; school, friendship and life satisfaction;

and achievement motivation, flow/engagement, and emotion regulation (details in supplemental document).

First we examined how the GI compared against the waitlist/controls on changes in outcomes. Then we examined students' use of the GiveThx app during the 6 weeks as demonstrations of grateful personality behaviors – the qualities of intensity, frequency, density (number of things), and span (number of people) that define grateful individuals (McCullough et al., 2002). Lastly, we examined the expression of thanks broadly as a predictor of social emotional competence.

Below, we present four key findings for GI scholars, practitioners, and educators that stem from the results of this study. As the purposes of this paper are to present the current state of GIs and introduce innovation, limited methodological and measurement information and results are presented here. For further information, please see the included supplemental information for methods and results.

Key findings for school GI

It is possible to increase trait gratitude

While most interventions increase state gratitude (including the current intervention), it is not common to see increases in trait gratitude. To investigate this, we conducted a t-test using trait gratitude as our dependent variable; specifically, we investigated the changes in trait gratitude between the experimental and control groups from T1 to T2. Results revealed that our modified GI showed significant increases in trait gratitude from T1 to T2, compared to the control group, $t(242) = -4.28$, $p < .001$, $d = .55$. A line graph representing the change in mean scores is displayed in [Figure 1](#) (scores were adjusted to account for baseline differences).

Interpersonal, technologically integrative GIs lead to increases in wellbeing and decreases in negative mental health

Meta-analyses indicate inconsistency in the efficacy of GIs for wellbeing and mental health related outcomes (Davis et al., 2016; Renshaw & Olinger Steeves, 2016). With this GI, participants in the experimental condition significantly outperformed those in the control condition in terms of personal and social wellbeing related outcomes, including positive affect, $t(242) = -2.37$, $p = .019$, $d = .31$, life satisfaction, $t(242) = -3.53$, $p = .001$, $d = .46$, and friendship satisfaction $t(238) = -2.53$, $p = .012$, $d = .33$. Additionally, participants in the experimental condition significantly improved in mental health

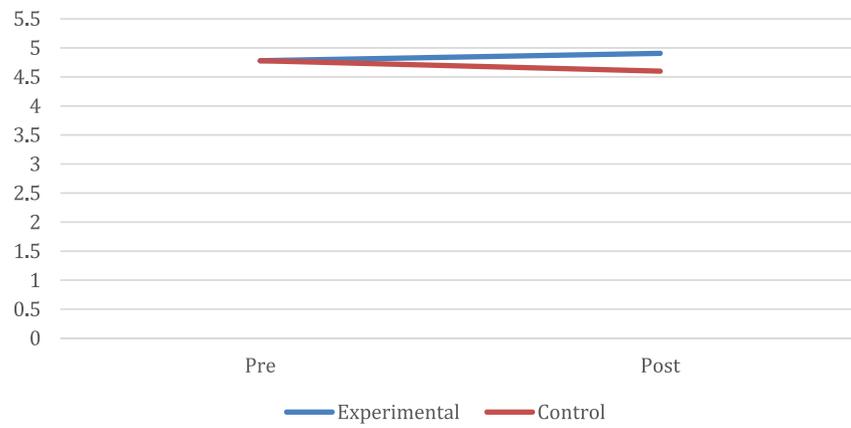


Figure 1. Changes in trait gratitude across time points.

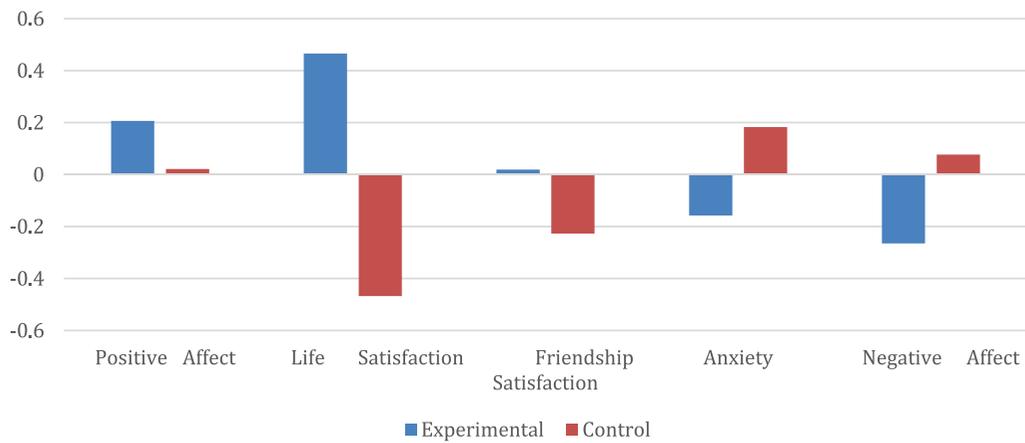


Figure 2. Change scores in mental health, personal and social wellbeing.

	Student 1	Student 2	Student 3	Student 4
Week 1	Thanks for being such a kind and thoughtful friend. love you!	Thanks for helping me in art!	Thank you for being hella funny in class.	Thanks for always making me laugh! OOF
Week 4	Ivan I just wanted to say that although we don't speak as much, I see all the hard work you put into your academics. You're a kind and unique person and you should be proud of all your accomplishments. Keep up the good work!!	Thanks for being a great friend, I know you say you're not social, but you've grown amongst all of us. Keep being you dude.	Thanks for always helping me with English and history.	Thank you for helping me last class with the readings! and also for asking that question!!
Week 6	Hey Mr.Rummel, I wanted to say thank you for always helping me with my writing and leaving me comments that help me improve my skills, thank you for being honest and patient with me.	The amount of positivity that you bring to the school is incredible. You always strive to be and do the best and I really respect that.	Thank you for always helping me when I don't understand something.	I just wanted to thank you for everything you wrote, it really made my day. I just wanted to say that I admire you because of how outgoing you are and for always just spreading your joy in school. and I mean it when I say that we need more people like you

Figure 3. Illustration of students' thx notes to others (teacher and peers) during the intervention.

related outcomes, compared to the control group, including improvements in anxiety, $t(242) = 3.21$, $p = .001$, $d = .42$, and negative affect, $t(242) = 3.83$, $p < .001$, $d = .49$. See [Figure 2](#) (again, scores were adjusted to account for baseline differences). These t-tests were performed using change scores.

The value of technology for experiencing and expressing thanks

Before considering our findings from use of GiveThx, it helps to consider the technology's advantages for students, educators, and researchers, compared to paper-based GIs. Users select a tag for each thx note they write and can graph frequency distributions of thx notes given and received anytime. [Figure 3](#) displays participants' thx notes at the start, midway, and end of the intervention to illustrate the advantages. Students can monitor their practice and learn to thank more creatively, as the increasing specificity in thanking over time shows; but they can also produce graphs to reflect on the reasons they are grateful to others or the reasons others are grateful to them. Thus, students can better understand not just the personal issues they face and the social capital helping them through, but how they matter to others too. Because the app records usage automatically, educators can monitor students' app use, gain visibility into students' personal/social lives, and learn to facilitate the intervention better than is possible with paper-based interventions. They can also build rapport with students by using the app. Finally, because the GI produces electronic artifacts, researchers gain visibility on program implementation fidelity and can more easily conduct qualitative and mixed-methods research.

This brings us to our findings with app-use as a behavioral measure of interpersonal gratitude. All teachers expected students to use GiveThx at least twice a week. To examine if basic app-use was associated with greater frequency of thanking, we compared the average number of weekly thx notes given during the first

and last three weeks of the intervention among classes only using GiveThx first. Students gave significantly more thx notes in the last 3 weeks ($M = 1.39$, $SD = 1.08$) than the first 3 weeks ($M = 1.18$, $SD = .70$), $t(120) = 2.45$, $p = .016$. Thus, using GiveThx, in itself, engages students. However, they thanked less frequently ($M = 1.28$, $SD = .79$) than the GI classes ($M = 2.38$, $SD = 1.34$) overall throughout the 6 weeks, $t(269.15) = 8.66$, $p < .001$. Notably, only GI classes exceeded frequency expectations.

Next, we compared GiveThx use between the intervention and app-only groups in terms of the other grateful personality behaviors (McCullough et al., 2002). GI classes outperformed ($M = 22.66$, $SD = 8.50$) the app-only classes ($M = 15.79$, $SD = 8.90$) in gratitude intensity (average number of words in each thx note) overall, $t(282) = 6.60$, $p < .001$. Gratitude density (ratio of average number of tags over average number of thx notes) did not significantly differ between the two groups. However, gratitude span (ratio of average number of unique recipients over average number of thx notes), which our GI explicitly targeted, was higher in GI classes ($M = .76$, $SD = .27$) than app-only classes ($M = .63$, $SD = .26$), $t(282) = 4.01$, $p < .001$. This indicates that students in our GI expressed thanks to a wider range of recipients.

Does expressing thanks support social-emotional competencies?

To examine whether an important feature of our GI, interpersonal gratitude, predicted changes in various outcomes valued by schools, we conducted several hierarchical multiple linear regression analyses with the intervention and control classes. Specifically, we examined if expressing thanks to others at baseline impacted different dependent measures six weeks later beyond the effects of baseline levels of the dependent measures.

Expressing thanks to others broadly supported CASEL's recommendations. [Table 1](#) shows the unstandardized

Table 1. Multiple linear regressions of thanking others' effects on changes in dependent variables.

Dependent Variable	β	t	ΔR^2	p
Engagement/Flow	.214	3.52	.039	.000
Achievement Motivation	.167	2.84	.023	.005
Emotion Regulation	.131	2.37	.015	.019
Altruism	.159	2.56	.017	.011
Prosocial Behavior	.136	2.55	.017	.012
Positive Relationships	.123	2.03	.012	.044
Teacher Relationship	.108	2.11	.010	.036
Meaning in Life	.159	2.65	.019	.009
School Satisfaction	.102	1.98	.009	.049

Note: Statistics represent effects of the predictor variable at baseline entered in the second step of regressions on dependent variables at 6 weeks, above and beyond the effects of baseline dependent variable scores entered in the first step of regressions (not included here).

coefficient and R^2 change statistics for its effects on changes in different outcomes. Thanking others was associated with significant increases in indicators of all five competencies. In terms of contribution to the competency of Self-Awareness, it accounted for 3.9% of increases in engagement/flow, $\Delta F(1, 235) = 12.40, p < .001$. In terms of Self-Management, thanking others accounted for 2.3% of increases in achievement motivation, $\Delta F(1, 233) = 8.08, p = .005$, and 1.5% of increases in emotion regulation, $\Delta F(1, 238) = 5.59, p = .019$. Thanking others accounted for 1.7% of increases in altruism, $\Delta F(1, 233) = 6.57, p = .011$, indicating contribution to Social Awareness. In terms of Relationship Skills, thanking others accounted for 1.7% of increases in prosocial behavior, $\Delta F(1, 231) = 6.49, p = .012$, 1.2% of increases in positive relationships, $\Delta F(1, 233) = 4.12, p = .044$, and 1.0% of increases in teacher relationship quality, $\Delta F(1, 232) = 4.46, p = .036$. Finally, thanking others accounted for 1.9% of increases in meaning in life, $\Delta F(1, 233) = 7.02, p = .009$, and 0.9% of increases in school satisfaction, $\Delta F(1, 237) = 3.93, p = .049$, which indicates readiness for Responsible Decision-Making. Thus, emphasizing interpersonal gratitude more in school GIs to support students' SEL competencies seems worthwhile.

Discussion and conclusion

This paper shared a new approach for school GIs that addressed major limitations in the field and provided initial findings that generally supported its effectiveness for broadly fostering student wellbeing and social connection. Previous GI research insufficiently incorporated key qualities, such as personalized-fit (Lyubomirsky et al., 2011) and expressing thanks to others (Lambert et al., 2013; Seligman et al., 2005). Moreover, recent evidence indicates that egocentric biases about interpersonal gratitude prevent individuals from actually practicing it (Kumar & Epley, 2018). Our GI approach addressed these issues by including various age-appropriate practices (interpersonal and general gratitude) in combination with a social-media-like app (GiveThx) that engaged students in the autonomous giving and receiving of thanks in class and supported them in developing a habit of practice.

Compared to waitlist and control classes, our GI showed medium intervention effects on trait gratitude, anxiety symptoms, negative affect and life satisfaction on male and female students; and medium effects on boys' depression symptoms and on girls' perceived stress. Furthermore, we found moderately small intervention effects on positive affect and friendship satisfaction. These results suggest that our GI broadly supports the SEL competencies of Self-Awareness, Self-Management, Relationship Skills, and readiness for Responsible Decision-Making.

However, it is important to note that, while participants in the intervention condition did feel improvements in their life satisfaction and friendship satisfaction, these were offset by clear reductions in friendship and life satisfaction for control group participants. Though it is not clear why these reductions occurred, school intervention researchers often note that there is a 'drop' across the school year in motivation and enthusiasm for learning (Mangan et al., 2020). That is, it may be that that friendship and life satisfaction naturally decline across the school year for students; thus, while friendship satisfaction only minimally improved for participants in the control group, this result may be significant because participants in the intervention not only resisted a natural tendency to feel less friendship satisfaction across the school year, but actually even felt improvements in this area. Life satisfaction, even more impressively, showed large improvements compared to the large reductions in life satisfaction experienced by participants in the control group. Life satisfaction may have improved on a grander scale because it is more general; that is, it encompasses all the different aspects of one's life, many of which may have improved for participants in the intervention group. Future researchers should investigate a baseline for the natural progression of these variables across the school year to gain more clarity into why students may have felt less friendship or life satisfaction over time.

We also found that GI students demonstrated more interpersonal gratitude behavior in their use of the app, compared to app-only students. Considered together with the intervention effect on trait gratitude, this implies sustainable effects on student gratitude practices. Beyond impacts, these findings illustrate practical uses of GiveThx for implementing interventions and monitoring fidelity. That is, aside from inducing gratitude, the app lets students behaviorally demonstrate their gratitude competence, and it automatically tracks intervention dosage, which is otherwise challenging in applied research. By collecting interpersonal gratitude artifacts and student reflections, GiveThx also provides rich qualitative data. Educators can thus facilitate GIs better by encouraging participation from all students, trying to help all students feel appreciated, striving to understand students personally more, and trying to improve rapport with students. These are important resources for supporting student belonging and creating positive classroom culture. Finally, researchers can use the qualitative data collected to examine phenomena such as student wellbeing, the formation and strengthening relationships and social networks, and academic motivation and identity.

Lastly, we found that expressing thanks is an important component for supporting SEL competencies. Specifically, control/waitlist students who reported thanking others more were more likely to report improvements in outcomes that were broadly indicative of all five CASEL competencies. Though we did not achieve intervention effects on relationship quality or school satisfaction in this pilot research, we believe further training and development may help improve GI effectiveness in these areas too.

Our study had some limitations. Intervention effects were obtained with student-report data, and examining teacher-report and hard school data (i.e., conduct, discipline, GPA/achievement data, test scores) with an experimental design would strengthen evaluations of the GI's effectiveness. Also, our sample included two, predominantly-Hispanic, urban high schools, and research should test the GI with students of different ethnic backgrounds and across different types of schools. Research should examine GI effects over a longer period of time than 6 weeks, applications to grade-levels beyond high school, and whether greater dosages would help, as lessons could easily be extended upon and applied meaningfully in different ways. Finally, researching effects on teachers and the wider school community would help evaluate if such efforts stimulate organizational development too.

Nonetheless, the behavioral data gleaned from the app-use (and anecdotes) suggest that students enjoyed using GiveThx and show substantive changes in how they express gratitude to others; and intervention effects were obtained from various classes and teachers using virtually no training. More training will likely yield more effective GI facilitation, more uniform GI delivery, and we believe, improved and broader impacts on students and school culture. For instance, teachers can be creative in building rapport with students or complimenting ongoing collaborative learning projects.

This paper introduced an approach for GIs in school that appears effective for engaging students in developing authentic gratitude habits and shares effects that have been elusive in the field. We found that a top-down psychoeducational approach (curriculum) together with a bottom-up approach (app) overcomes obstacles to the interpersonal practice of gratitude (i.e., egocentric biases) and that this not only helped broadly support student wellness, but their social connection too. That GI students became more satisfied with their own friendships is significant; it suggests that students personally applied the practices to their actual social relationships. Importantly, our proposed approach makes habit development more accessible to everyone. The prospect of extending support for mental health, connection and thriving to more students through such low-cost and non-clinical methods underscores the value of using GIs

in schools today, especially given the dual-challenge many face of serving diverse students with stressed budgets. In conclusion, we shared a GI approach that seems to harness the power of gratitude to boost students' personal and social wellbeing. When schools invest in optimizing their human capital like this, everyone at school benefits by being ready, and motivated, to grow. Could GIs enhance school character/wellness initiatives and better foster student success – in school and beyond? Let gratitude in, and let's see what happens.

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