

When it Feels Good to Give: Depressive Symptoms, Daily Prosocial Behavior, and Adolescent  
Mood

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Accepted for publication in *Emotion* on 6/27/2018.

This project is based on work supported by NSF SBE Postdoctoral Research Fellowship (SPRF) 1714304 (Schacter, PI), NSF BCS-1627272 (Margolin, PI), and NIH-NICHD R21-HD072170 A1 (Margolin, PI). We also want to thank the adolescents who participated in the study and our USC Family Studies Project colleagues.

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<http://dx.doi.org/10.1037/emo0000494>

### **Abstract**

Past research suggests that engaging in prosocial acts enhances the well-being of the helper, but does prosocial behavior benefit some individuals more than others? The current study implements a daily diary design to test associations between adolescents' daily prosocial behaviors towards relationally close others and mood. The main goal was to investigate whether daily help-giving has unique benefits for adolescents experiencing greater emotional distress. For 10 days, a diverse sample of youth ( $N=99$ ;  $M_{age}=18.01$ ) reported on their prosocial behaviors towards friends and romantic partners as well as their mood; depressive symptoms were assessed in a prior lab visit. Multilevel models show that participants experienced increased positive mood on days that they were more prosocial, even when controlling for received support; this association was strongest among those reporting higher depressive symptoms. The findings highlight the unique benefits of prosociality in adolescents' daily lives, suggesting that everyday help-giving behaviors may fulfill social and emotional needs of depressed youth.

Keywords: prosocial behavior, depressive symptoms, mood, adolescence, daily diary

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Although adolescence is characterized by many normative challenges, such as puberty, school transitions, and navigating an increasingly complex social landscape, this is also a high-risk period for the onset of clinical mood disorders, particularly depression (Rudolph, 2009). Depressive disorders typically increase in prevalence across adolescence, with up to 14% of adolescents experiencing clinical depression (Lewinsohn & Essau, 2002) and many (20-50%) reporting significant symptoms (Kessler, Avenevoli, & Merikangas 2001). Moreover, as emphasized by interpersonal theories of depression (Rudolph, 2009), hallmarks of adolescent depression include heightened interpersonal sensitivity and social-evaluative concerns. That is, during a developmental period where adolescents already become increasingly preoccupied with the opinions of their peers and romantic partners (Blakemore & Mills, 2014), depressed adolescents exhibit intensified negative emotions following stressful social experiences (e.g., rejection; Silk et al., 2014).

Despite evidence that depressed adolescents demonstrate heightened sensitivity to negative social interactions, little is known about whether they are also highly attuned to *positive* interpersonal interactions, particularly those that promote a sense of social self-efficacy and personal value within close relationships. Given that depressed adolescents often doubt their interpersonal worth and describe themselves as lacking social competence (Rudolph, 2009), they may feel especially rewarded by engaging in behaviors that elicit positive responses from close others. One such behavior is help-giving, and growing evidence suggests that prosocial behavior offers emotional benefits to givers (e.g., Alden & Trew, 2013; Morelli, Lee, Arnn, & Zaki, 2015; Raposa, Laws, & Ansell, 2016). The goal of the current study, in turn, was to investigate whether adolescents' daily acts of kindness towards friends and romantic partners are more or less mood-enhancing depending on adolescents' depressive symptoms. Given that anhedonia (i.e., lack of

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pleasure) is a central component of depression, identifying everyday social behaviors that could boost positive mood among depressed adolescents is a clinically important task (Forbes & Dahl, 2005).

Past research demonstrates far-reaching benefits of prosocial behavior among healthy populations across the lifespan. For example, adults who participate in volunteer work (Piliavin & Siegl, 2007), spend money on others (Hill & Howell, 2014), and provide emotional support to spouses (Brown, Nesse, Vinokur, & Smith, 2003) experience enhanced well-being and even reduced mortality risk (Brown et al. 2003). At the daily level, adults feel better on days that they help (e.g., holding open a door) a stranger or acquaintance (Raposa et al., 2016) or support a friend (Morelli et al., 2015). Among youth, prosociality has similarly been linked to increased self-esteem across adolescence (Zuffianò et al., 2014) and positive mood during preadolescence (Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2012). Thus, engaging in prosocial behavior promotes greater well-being both on a day-to-day and long-term basis.

Nevertheless, individual differences may influence the association between prosocial behavior and emotional functioning (Alden & Trew, 2013). Here we suggest the importance of considering prosocial behavior in the context of adolescents' depressive symptoms, though there are competing hypotheses about the direction of such effects. On one hand, insofar as depression is typically characterized by negative self-views (e.g., feeling ineffective, unworthy) and anhedonia (difficulty experiencing and sustaining pleasure), depressed compared to non-depressed youth may exhibit a dampened positive response to helping close others. On the other hand, given that adolescents with depressive symptoms experience heightened interpersonal sensitivity and fear social disapproval from close others, providing support to a friend or romantic partner may actually be personally rewarding and promote enhanced positive mood

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among these youth. That is, much like depressed youth display elevated reactivity to interpersonal *stressors*, they may also derive the greatest benefits from engaging in positive interpersonal behaviors.

### **The Current Study**

The main goal of this study was to examine whether daily associations between prosocial behavior *given* and mood varied depending on adolescents' depressive symptoms. Moreover, we test whether these effects can be detected even after accounting for adolescents' daily and average support *received* from friends and dating partners as well as their anxiety symptoms. We use daily diaries to capture the natural occurrence of adolescents' prosocial behavior and day-to-day fluctuations in mood, increasing ecological validity and reducing recall bias. These questions were tested using multilevel modeling, allowing us to control for lagged mood effects, between-person differences in prosociality, and demographic covariates while examining within-day processes. Additionally, focusing on a diverse community sample of youth and considering prosocial behavior within developmentally salient interpersonal contexts, we extend past related research that typically focuses on help-giving to undefined "others" among adults or undergraduates.

### **Method**

Data were drawn from a larger longitudinal study examining family influences on adolescent adjustment. Participants in the Los Angeles area were recruited through word-of-mouth, flyers, and other advertisements. To be eligible, parents must have lived together for at least 3 years and have a child ages 9-10 years old (Cohort 1, recruited at Wave 1) or in middle school (Cohort 2, recruited at Wave 3). The data presented here were part of Wave 5 in-lab and

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at-home procedures for both cohorts when participants were late adolescents (see Appendix A for additional methodological details).

### Participants

Of the 131 youth completing some portion of Wave 5 procedures, 103 (45% female) participated in daily diary data collection ( $M_{age}=18.02$ ;  $SD_{age}=1.12$ ). Based on self-reports of race/ethnicity, participants were 35.0% Caucasian, 22.3% Hispanic/Latinx, 20.4% Black/African American, 14.6% Multiracial, 3.9% Asian/Native Hawaiian/Pacific Islander, and 3.9% of participants did not report.

### Procedure

During Wave 5, participants completed an in-lab questionnaire including a measure of depressive symptoms, after which they received instructions for completing the 10 daily surveys. Compliance was high; 72% of participants completed all 10 days of surveys ( $M_{days}=8.98$ ;  $SD=2.24$ ), resulting in 925 days of daily data. Most surveys (82%) were completed within 24 hours of the intended date. Four participants who did not provide at least 2 consecutive days of data were excluded from all analyses, and two additional participants who did not report anxiety symptoms were excluded from final multilevel models. Therefore, descriptive data reflect  $n=99$  and multilevel models reflect  $n=97$ . Multilevel simulation studies suggest that a Level 2 sample size  $>50$  with  $>5$  observations per individual should yield unbiased estimates and adequate power to detect medium and large effects (McNeish & Stapleton, 2016; Scherbaum & Ferreter, 2009).

### Measures

**Daily prosocial behavior.** Every day participants reported on their prosocial behaviors towards a) friends and b) dating partners (Bennett, Guran, Ramos, & Margolin, 2011). Responses

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were rated on a 3-point scale ranging from 0 (*not at all*) to 2 (*a lot*). Items asked about standing up for someone, helping someone out, and making someone feel their thoughts and feelings are important. The 6 items (3 for friends, 3 for dating partners) were averaged for a score of daily prosocial behavior. Participants' average prosocial behavior across the 10 days was also calculated as a person-level composite. Within- and between-person reliability was calculated using multilevel confirmatory factor analysis recommended for repeated measures data (Geldhof, Preacher, & Zyphur, 2014). Based on guidelines for evaluating reliability in diary studies (Nezlek, 2017), within-person reliability was adequate ( $\alpha=.60$ ) and between-person reliability was high ( $\alpha=.85$ ).

**Daily mood.** Positive and negative mood were assessed daily using the Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988). 10 items captured positive mood (e.g., excited; proud) and 10 items captured negative mood (e.g., distressed; scared); scores ranged from 0 (*very slight or not at all*) to 4 (*extremely*). Positive mood (PM) and negative mood (NM) scores were summed and averaged. Within-person ( $\alpha_{NM}=.76$ ;  $\alpha_{PM}=.84$ ) and between-person ( $\alpha_{NM}=.93$ ;  $\alpha_{PM}=.94$ ) reliabilities were high.

**Depressive symptoms.** Depressive symptoms were assessed using the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996). One item assessing suicidal ideation was excluded, resulting in 20 items ( $\alpha=.89$ ). Participants reported how they felt during the past two weeks on a 4-point scale (0=*I do not feel sad* to 3=*I am so sad or unhappy that I can't stand it*). Items were summed and scaled to the full (21 item) metric.

**Additional covariates.** Within-person covariates included reporting day number, whether it was a weekday or weekend, and daily support received from friends and dating partners (using identical prosocial behavior items with participant as recipient; Bennett et al.,

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2011). Between-person covariates included sex, age, anxiety symptoms (based on State-Trait Anxiety Inventory for Children; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and average support received by friends.

### **Analytic Plan**

Two-level multilevel modeling with maximum likelihood estimation and robust standard errors (MLR) was conducted to account for repeated observations within individuals. We first tested prosocial behavior as a predictor of same-day positive and negative mood, controlling for prior-day mood, reporting day, weekday(0) versus weekend(1), and daily support received at Level 1, and sex (1=male; 0=female), age, anxiety symptoms (grand-mean centered), average support received, depressive symptoms, and average prosocial behavior at Level 2. Testing the daily effects of prosocial behavior and controlling for its cross-time mean at Level 2 yields its unique within-person effect after controlling for participants' general tendency behave prosocially (Hoffman, 2015). To test our moderation hypothesis, we added a cross-level *daily prosocial behavior X depressive symptoms* interaction, controlling for the corresponding Level 2 *average prosocial behavior X depressive symptoms* interaction.

## **Results**

### **Descriptive Statistics**

Table 1 presents bivariate correlations, descriptive statistics, and intraclass correlations. Most youth (95%) engaged in prosocial behavior on at least one day, on average reporting prosocial behavior on 63% of days. Variables contained substantial within-person and between-person variability.

### **Multilevel Models**



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As seen in Table 2 (Models 1a and 2a), on days when adolescents reported more prosocial behavior, they experienced increased positive mood (Cohen's  $f^2 = .02$ ; Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012), even after controlling for prior-day positive mood, same-day received support, and average prosocial behavior across the 10 days. Daily prosocial behavior was unrelated to negative mood.

Table 2 (Models 1b and 2b) presents models including the *prosocial behavior X depressive symptoms* interactions. For positive mood, there was a significant cross-level interaction between daily prosocial behavior and depressive symptoms. Higher levels of daily prosocial behavior were related to increased positive daily mood for participants experiencing higher (+1SD;  $b = .593, p < .001$ ) but not lower (-1 SD,  $b = .122, p = .402$ ) levels of depressive symptoms. Holding all other variables constant (i.e., at zero), the predicted positive mood means for youth engaging in high (+1 SD) levels of prosocial behavior was 1.19 among those with higher (+1 SD) depressive symptoms and 1.01 among those with lower (-1 SD) depressive symptoms. This mean difference corresponds to a standardized effect size of  $d = .30$  (.18 mean difference/.60 within-person standard deviation of positive mood), indicating a relatively small effect. For negative mood, there were no *prosocial behavior X depressive symptoms* interactions.

## Discussion

The current study demonstrated daily links between adolescents' prosocial behavior and positive mood, which were strongest for those experiencing elevated depressive symptoms. Although adolescence has been described as a period of "storm and stress" characterized by interpersonal difficulties and emotional turbulence, here we took a strengths-based approach to highlight the positive behaviors that also characterize adolescents' daily lives. Indeed, almost all

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participants reported prosocial behavior on at least one day, and they typically helped a friend or romantic partner on more than half of all days.

Even after controlling for participants' average tendency to behave prosocially, their daily and average support *received* from friends and dating partners, and their prior-day mood, on days they stood up for, helped out, or provided emotional support to a friend or romantic partner, they experienced increased positive mood. By documenting this pattern among a community sample of youth and focusing on prosocial behavior within developmentally significant relationships, we extend past work that finds benefits of daily helping among (young) adults (e.g., Raposa et al. 2016) and typically focuses on acts of kindness directed towards strangers (see Morelli et al., 2015 and Alden & Trew, 2013 for exceptions). Similar to recent findings (Raposa et al., 2016), daily prosocial behavior was unrelated to negative mood. Adolescents reported very low levels of negative mood across the diary period; thus, we anticipate that floor effects may partially account for the lack of such an association. Additionally, although we focused on positive interpersonal interactions, adolescents also experience a number of stressors in their everyday lives (e.g., academic demands; family conflict; Kiang & Buchanan, 2014) that may be stronger predictors of daily negative mood than positive interpersonal behaviors. Finally, given that negative and positive mood were uncorrelated, the findings suggest distinct pathways to enhancing positive mood and reducing negative mood (Forbes & Dahl, 2005).

The most novel finding of the current study was that daily associations between prosocial behavior and positive mood were strongest among youth experiencing more depressive symptoms, even after controlling for their anxiety symptoms. Our finding offers a novel contribution to past research documenting benefits of prosociality among individuals

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experiencing other psychological difficulties, such as neuroticism (Snippe et al., 2017), body dissatisfaction (Zuffianò et al., 2018) and social anxiety (Alden & Trew, 2013). While tests of underlying mechanisms were beyond the scope of this study, the findings may be best understood within theoretical models emphasizing the interpersonal context of adolescent depression (Rudolph, 2009). During adolescence, as peer and dating relationships carry increased affective salience, youth with depressive symptoms display potentiated responses to social threat via neural reactivity in emotion regions (e.g., amygdala; Silk et al., 2014). Here we suggest a similar pattern of interpersonal sensitivity for *positive* social experiences, wherein helping close others promotes self-efficacy and agency within interpersonal contexts for youth who are reactive to social evaluation (Caprara, Alessandri, & Eisenberg, 2012). Despite less research examining depressed adolescents' emotional reactivity to positive social experiences, initial evidence indeed suggests similar patterns of increased activation in affective processing regions when presented with positive social feedback (e.g., acceptance; Davey, Allen, Harrison, Yücel, 2011). In turn, acting prosocially in the face of stress could also promote adolescents' resiliency by reinstating their sense of purpose and belonging (Griese, Buhs, & Lester, 2016).

Several limitations of this study warrant discussion. Although daily diaries minimize recall bias, all measures were self-reports. We also cannot disentangle the sequence of effects; positive mood may precede prosocial behaviors or these links may be reciprocal. Future studies should incorporate multiple within-day reports to examine sequential patterns over time (Snippe et al., 2017). Additionally, by collapsing prosocial behavior across friends and romantic partners (given low within-person reliability of the separate scales), questions remain about the findings' generalizability across different relationship contexts and as a function of prosocial behaviors that are more or less costly to the helper. Finally, although we have discussed plausible

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mechanisms accounting for the current findings, future work should investigate intervening processes that can account for amplified prosociality-mood links among emotionally distressed adolescents.

This study extends past work by providing insight into *for whom* engaging in acts of kindness may be most emotionally rewarding during adolescence. The findings have important clinical implications, suggesting that day-to-day behaviors could offer meaningful intervention points for improving mood. In addition to helping depressed adolescents build and maintain social networks where they can *receive* support, interventions could seek to increase adolescents' opportunities to *provide* help as a means of mood-enhancement. Experimental studies that compare acts of kindness to other ostensibly rewarding activities (e.g., self-care) among clinical populations (e.g., Alden & Trew, 2013) will be critical in further elucidating the unique benefits of prosocial behavior.

References

- Alden, L. E., & Trew, J. L. (2013). If it makes you happy: Engaging in kind acts increases positive affect in socially anxious individuals. *Emotion, 13*, 64-75. doi:10.1037/a0027761
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck depression inventory-ii*. San Antonio, TX: Psychological Corporation.
- Bennett, D. C. B. A., Guran, E. L. B. A., Ramos, M. C. P., & Margolin, G. P. (2011). College students' electronic victimization in friendships and dating relationships: Anticipated distress and associations with risky behaviors. *Violence and Victims, 26*, 410-429.
- Blakemore, S. J., & Mills, K. L. (2014). Is adolescence a sensitive period for sociocultural processing? *Annual Review of Psychology, 65*, 187-207. doi:10.1146/annurev-psych-010213-115202
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. *Psychological Science, 14*, 320-327. doi:10.1111/1467-9280.14461
- Caprara, G. V., Alessandri, G., & Eisenberg, N. (2012). Prosociality: The contribution of traits, values, and self-efficacy beliefs. *Journal of Personality & Social Psychology, 102*, 1289-1303. doi:10.1037/a0025626. Epub 2011 Sep 26.
- Davey, C.G., Allen, N.B., Harrison, B.J., & Yücel, M. (2011). Increased amygdala response to positive social feedback in young people with major depressive disorder. *Biological Psychiatry, 69*, 734-741. doi: 10.1016/j.biopsych.2010.12.004
- Forbes, E.E., & Dahl, R.E. (2005). Neural systems of positive affect: relevance to understanding child and adolescent depression? *Developmental Psychopathology, 17*, 827-850. doi: 10.1017/S095457940505039X

## DAILY PROSOCIAL BEHAVIOR

- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods, 19*, 72-91.  
doi:10.1037/a0032138
- Griese, E.R., Buhs, E.S., & Lester, H.F. (2016). Peer victimization and prosocial behavior trajectories: Exploring sources of resilience for victims. *Journal of Applied Developmental Psychology, 44*, 1-11. doi: 10.1016/j.appdev.2016.01.009
- Hill, G., & Howell, R. T. (2014). Moderators and mediators of pro-social spending and well-being: The influence of values and psychological need satisfaction. *Personality and Individual Differences, 69*, 69-74. doi:10.1016/j.paid.2014.05.013
- Hoffman, L. (2015). *Longitudinal analysis: Modeling within-person fluctuation and change*. New York, NY: Routledge.
- Kessler, R.C., Avenevoli, S., & Merikangas, K.R. (2001). Mood disorders in children and adolescents: an epidemiologic perspective. *Biological Psychiatry, 49*, 1002-1014. doi: 10.1016/S0006-3223(01)01129-5
- Kiang, L., & Buchanan, C.M. (2014). Daily stress and emotional well-being among Asian American adolescents: Same-day, lagged, and chronic associations. *Developmental Psychology, 50*, 611-621. doi: 10.1037/a0033645
- Layous, K., Nelson, S. K., Oberle, E., Schonert-Reichl, K. A., & Lyubomirsky, S. (2012). Kindness counts: Prompting prosocial behavior in preadolescents boosts peer acceptance and well-being. *PLOS ONE, 7*, e51380. doi:10.1371/journal.pone.0051380
- Lewinsohn, P.M., & Essau, C.A. (2002). Depression in adolescents. In I.H. Gotlib & C.L. Hammen (Eds.), *Handbook of depression* (pp. 541-559). New York, NY: Guilford Press.

## DAILY PROSOCIAL BEHAVIOR

- McNeish, D.M. & Stapleton, L.M. (2016). The effect of small sample size on two-level model estimates: A review and illustration. *Educational Psychology Review*, 28, 295-314. <http://dx.doi.org/10.1007/s10648-014-9287-x>
- Morelli, S. A., Lee, I. A., Arnn, M. E., & Zaki, J. (2015). Emotional and instrumental support provision interact to predict well-being. *Emotion*, 15, 484-493. doi:10.1037/emo0000084
- Nezlek, J. B. (2017). A practical guide to understanding reliability in studies of within-person variability. *Journal of Research in Personality*, 69, 149-155. doi:10.1016/j.jrp.2016.06.020
- Piliavin, J. A., & Siegl, E. (2007). Health benefits of volunteering in the wisconsin longitudinal study. *Journal of Health & Social Behavior*, 48, 450-464. doi:10.1177/002214650704800408
- Raposa, E. B., Laws, H. B., & Ansell, E. B. (2016). Prosocial behavior mitigates the negative effects of stress in everyday life. *Clinical Psychological Science*, 4, 691-698. doi:10.1177/2167702615611073
- Rudolph, K. (2009). Adolescent depression. In Gotlib, I., Hammen, C. (Eds.), *Handbook of depression* (pp. 444-466). New York, NY: Guilford.
- Scherbaum, C.A. & Ferreter, J.M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. *Organizational Research Methods*, 12, 347-367. <http://dx.doi.org/10.1177/1094428107308906>
- Selya, A.S., Rose, J.S., Dierker, L.C., Hedeker, D., & Mermelstein, R.J. (2012). A practical guide to calculating Cohen's  $f^2$ , a measure of local effect size, from PROC MIXED. *Frontiers in Psychology*, 3, 2-6. doi: 10.3389/fpsyg.2012.00111

## DAILY PROSOCIAL BEHAVIOR

Silk, J.S., Siegle, G.J., Lee, K.H., Nelson, E.E., Stroud, L.R., & Dahl, R.E. (2014). Increased neural response to peer rejection associated with adolescent depression and pubertal development. *Social Cognitive Neuroscience*, 9, 1798-1807. doi: 10.1093/scan/nst175

Snippe, E., Jeronimus, B. F., aan het Rot, M., Bos, E. H., de Jonge, P., & Wichers, M. (2017). The reciprocity of prosocial behavior and positive affect in daily life. *Journal of Personality*, 86, 139-146. doi:10.1111/jopy.12299

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The panas scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.

Zuffianò, A., Alessandri, G., Luengo Kanacri, B. P., Pastorelli, C., Milioni, M., Ceravolo, R., . . . Caprara, G. V. (2014). The relation between prosociality and self-esteem from middle-adolescence to young adulthood. *Personality and Individual Differences*, 63, 24-29. doi:10.1016/j.paid.2014.01.041

Zuffianò, A., Martí-Vilar, M., & López-Pérez, B. (2018). Prosociality and life satisfaction: A daily-diary investigation among spanish university students. *Personality and Individual Differences*, 123, 17-20. doi:10.1016/j.paid.2017.10.042



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Table 1. *Person-Level (Cross-Time) Correlations, Descriptive Statistics, and Intraclass Correlations for Prosocial Behavior, Mood, and Depressive Symptoms.*

	1.	2.	3.	4.
1. Prosocial behavior	--			
2. Positive mood	.495***	--		
3. Negative mood	.176	.164	--	
4. Depressive symptoms	-.160	-.107	.285**	--
<i>M</i> ( <i>SD</i> )	.46(.34)	1.24(.64)	.37(.30)	7.45(7.04)
ICC	.44	.50	.37	N/A

*Note.* \*\*\* $p < .001$ , \*\* $p < .01$ . ICC=intraclass correlation.

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Table 2. *Daily Prosocial Behavior Predicting Positive and Negative Mood (1a & 2a) and Depressive Symptoms as a Moderator (1b & 2b).*

	1a. Positive Mood			1b. Positive Mood			2a. Negative Mood			2b. Negative Mood		
Daily Level	<i>b</i>	SE	95% CI	<i>b</i>	SE	95% CI	<i>b</i>	SE	95% CI	<i>b</i>	SE	95% CI
Prior day mood (t-1)	.049	.062	-.072, .170	.052	.063	-.071, .175	.133*	.062	.011, .255	.123	.067	-.007, .254
Reporting day number (t)	-.017	.010	-.036, .001	-.016	.009	-.035, .002	-.009	.005	-.019, .000	-.010*	.005	-.020, .000
Weekend (t; 0= <i>weekday</i> ; 1= <i>weekend</i> )	-.037	.047	-.129, .056	-.044	.047	-.136, .048	-.020	.027	-.072, .032	-.026	.027	-.078, .026
Support received (t)	.104	.099	-.089, .298	.079	.101	-.119, .277	.103*	.049	.007, .200	.109*	.050	.011, .207
Prosocial behavior (t)	.334**	.099	.140, .528	.122	.145	-.163, .406	-.069	.050	-.166, .028	-.176*	.077	-.326, .026
<b>Person Level</b>												
Gender (0= <i>girls</i> ; 1= <i>boys</i> )	.114	.109	-.099, .327	.083	.112	-.138, .303	.083	.050	-.016, .182	.083	.049	-.013, .179
Age	-.003	.047	-.094, .089	-.025	.051	-.125, .076	-.046	.024	-.093, .000	-.046	.024	-.093, .001
Average support received	.214	.492	-.750, 1.179	.132	.464	-.777, 1.041	-.025	.178	-.374, .324	.025	.181	-.330, .379
Anxiety symptoms	.020*	.008	.004, .035	.020**	.007	.005, .034	.007	.004	-.001, .014	.008	.004	.000, .017
Depressive symptoms	-.016*	.008	-.033, .000	-.018	.010	-.037, .002	.007	.005	-.002, .017	.002	.005	-.008, .012
Average prosocial behavior	.283	.496	-.689, 1.256	.555	.514	-.453, 1.563	.179	.206	-.226, .583	.112	.208	-.295, .519
Depressive symptoms X Average prosocial behavior			—	-.023	.037	-.096, .050			—	.006	.012	-.019, .030
<b>Cross-Level Interaction</b>												
Depressive symptoms X Daily prosocial behavior			—	.033*	.013	.008, .058			—	.015	.008	-.001, .030

*Note.* \*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ . SE=standard error; CI=Confidence interval (rounded to third decimal); t=current day; t-1=prior day. Coefficients represent unstandardized estimates.

### **Appendix A: Supplemental Method Materials**

The current data were drawn from a multiwave study among two cohorts of youth from the Los Angeles area. The study included two cohorts of participants, the first of which was recruited at the beginning of the study when youth were 9-10 years old (Wave 1), and the second of which was recruited prior to the third study wave (Wave 3) when youth were in middle school (i.e., to be comparable to Cohort 1). Therefore, beginning at Wave 3, procedures were the same for the two cohorts. The current study relies on data from participants in both cohorts during Wave 5 of the study, when they were late adolescents. All participating youth provided assent and, if under the age of 18, their parents also provided consent for their child's participation. The study's procedures were approved by the university Institutional Review Board.

#### **Participants: Supplemental Information**

Participants in the current study ranged in age from 14.92 to 21.30, and 85% were 18 or under. This was a community sample, with 16% of participants currently attending college and 28% planning to start college within the upcoming year. Approximately 18% of the sample had parents who were separated or divorced at the time of study, and half (51%) reported that both of their parents were currently employed (12% father only, 10% mother only, 4% neither parent, and 23% not reporting on parent employment). Adolescents also reported on their family's level of current financial stress, with 50% of participants reporting at least "some" financial stress (18% reporting "a lot" and 3% reporting "an extreme amount"). Parents averaged 14.93 years of education (i.e., some college;  $SD=2.25$ ).

#### **Procedure: Supplemental Information**

Following a lab-based session, participants were given instructions for completing the daily diary surveys, and they completed Day 1 of the diary in lab by reporting on the prior day.

## DAILY PROSOCIAL BEHAVIOR

Participants then chose whether they wanted to complete online (Qualtrics) or paper questionnaires. Only thirteen participants requested paper, and they were sent home with nine questionnaires and corresponding prestamped envelopes to return. Participants completing online surveys received daily e-mail reminders that directed them to the Qualtrics survey. Surveys were identical across days and included items about daily interactions with friends and romantic partners, mood, as well as other domains of behavior (e.g., risk-taking) and social relationships (e.g., family interactions).