



Time among the taunted: The moderating effect of time perspective on bullying victimization and self-esteem in adolescents[☆]

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ABSTRACT

Introduction: Bullying victimization is detrimental to psychosocial wellbeing in adolescents. It is paramount that factors that mitigate the harmful effects of bullying victimization be identified. Time perspective may be a potential mechanism. Thus, we examined the moderating effect of time perspective on the associations between traditional and cyberbullying victimization (being bullied in person and on electronic media) and self-esteem in adolescents. Time perspective refers to feelings and thoughts about the past, present, and future. We examined *time feelings* (positive and negative feelings about the time periods), *time frequency* (frequency of thoughts about the time periods), and *time relation* (the perceived relationship among the time periods).

Methods: Two cross-sectional survey studies were conducted. Study 1 examined traditional bullying victimization in 721 American adolescents ($M_{age} = 15.84$, $SD = 1.20$; 57% female). Study 2 examined cyberbullying victimization in 190 American adolescents ($M_{age} = 15.83$, $SD = 1.28$; 59% female).

Results: Hierarchical linear regression analyses indicated that time perspective dimensions moderated the associations between high levels of traditional and cyberbullying victimization and self-esteem in adolescents who (a) had strong positive and weak negative feelings about the present and future (time feelings); (b) thought a little about the past (time frequency); or (c) perceived all time periods as interrelated (time relation).

Conclusions: Time perspective dimensions (feelings, frequency, and relation) moderated the associations between traditional and cyberbullying victimization and self-esteem in adolescents. Findings have implications for bullying victimization prevention efforts. Findings also demonstrate the multidimensional and multi-temporal qualities of time perspective.

Bullying is a public health issue of national importance (Megan, 2019). One in five adolescents are bullied in person, and nearly one in six are bullied on electronic media such as the internet and cellphones (Centers for Disease Control and Prevention, 2018). Bullying victimization includes the traditional (in-person) and cyber (electronic) forms. Adolescents who experience either traditional or cyberbullying victimization are vulnerable to psychosocial adjustment and psychological health issues (Forero et al., 1999; Garnefski & Kraaij, 2014; Şahin, 2012). In particular, low self-esteem has been observed in adolescents who experienced bullying victimization (Cénat et al., 2014; Rigby & Slee, 1993).

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Thus, it is paramount that research identify factors that mitigate the harmful effects of bullying. One potential factor may be time perspective—a cognitive-motivational multidimensional construct that refers to feelings and thoughts about our past, present, and future (Mello & Worrell, 2015; Zimbardo & Boyd, 1999). Studies have shown that time perspective was associated with positive psychosocial outcomes in adolescents experiencing adversities, such as family conflicts or running away from home (Arpawong et al., 2016; Mello et al., 2018). Specifically, feeling positively about time, thinking often about the future, and thinking that time periods are related were associated with greater self-esteem, optimism, and better interpersonal relationships. To extend this line of inquiry to bullying victimization, we conducted the current studies to investigate the moderating effect of time perspective on the associations between traditional and cyberbullying victimization and self-esteem.

1. Bullying victimization

1.1. Traditional bullying victimization

Traditional bullying victimization includes physical acts of aggression, verbal harassment, and social exclusion (Olweus, 1994). In adolescents, traditional bullying victimization has been associated with psychosocial adjustment issues such as greater loneliness (Forero et al., 1999), lower happiness, and lower self-esteem (Rigby & Slee, 1993). It has also been connected to greater psychological distress in the forms of anxiety and depression (Garnefski & Kraaij, 2014; Schoeler et al., 2018). At the extreme end, adolescents who experienced traditional bullying victimization reported more frequent suicidal ideation than their peers who were not involved (Kowalski & Limber, 2013). The impact of traditional bullying victimization extends beyond adolescence; adolescents who experienced traditional bullying victimization had greater risks for anxiety disorders as adults compared to their peers who did not (Copeland et al., 2013).

1.2. Cyberbullying victimization

Cyberbullying victimization includes instances such as receiving hurtful comments through text messages or having embarrassing photos of oneself posted on public websites without consent (Kowalski et al., 2014). Despite the “virtual” nature of cyberbullying victimization, adolescents have indicated that it can have as much—if not more—negative impact as traditional bullying victimization does (Smith et al., 2008). Adverse outcomes that are associated with cyberbullying victimization in adolescents are consistent with those for traditional bullying victimization (Bonanno & Hymel, 2013; Cénat et al., 2014; Gámez-Guadix et al., 2013; Rose & Tynes, 2015; Şahin, 2012).

1.3. Self-esteem

Self-esteem has been well-established as an important indicator of psychological wellbeing in adolescents. A recent meta-analysis showed that traditional bullying victimization and self-esteem were negatively associated in adolescents (Tsaousis, 2016). Another meta-analysis indicated that cyberbullying victimization was also negatively associated with self-esteem (Kowalski et al., 2014).

2. Time perspective

2.1. Theoretical conceptualization

Time perspective refers to the feelings and thoughts that individuals have about their past, present, and future (Mello & Worrell, 2015; Zimbardo & Boyd, 1999). Research on time perspective extends the literature on future orientation (Adelabu, 2008; Nurmi, 1991; Steinberg et al., 2009) by also considering the past and present. Time perspective has long been discussed as an age-related construct (Lewin, 1942; Piaget, 1955), although a considerable amount of research has focused on adults following Zimbardo and Boyd's (1999) seminal work. Recently, a new model for time perspective has been proposed that is specific to adolescents (Mello, 2019; Mello & Worrell, 2015).

Developmentally, adolescence is a particularly salient period through which to examine time perspective (Mello, 2019; Mello & Worrell, 2015). Cognitive advances (Piaget, 1975) and identity formation (Erikson, 1968) enable adolescents to consider time in a new way compared to children. Capacities for abstract and hypothetical thinking (Piaget, 1975) permit adolescents to consider their future selves in relationship to the past and present. Further, the primary developmental task of identity formation in adolescence involves successfully integrating one's past, present, and future selves (Erikson, 1968). Combined, adolescence serves as a fruitful age to examine time perspective.

Mello and colleagues (Mello, 2019; Mello & Worrell, 2015) proposed a model of time perspective that comprises unique dimensions, including feelings, frequency, and relation. *Time feelings* refer to positive and negative feelings about the past, present, and future. Prior research has shown that adolescents reported stronger positive feelings than negative feelings about time (Andretta et al., 2014; Konowalczyk et al., 2019). These studies have also shown that feelings about the future were stronger than those for other time periods. Moreover, research has consistently shown that time feelings include six distinct components: positive and negative feelings about each time period (Alansari et al., 2013; Donati et al., 2019; Worrell et al., 2013). *Time frequency* is defined as the frequency of thoughts about the time periods. Participants have varied in how often they thought about each time period (Konowalczyk et al., 2019; Mello et al., 2009). Young adults reported thinking about the time periods from “sometimes” to “often,” and this was particularly true for the future (Konowalczyk et al., 2019).

Time relation refers to how the past, present, and future are perceived to be related (see Table 2 for an illustration). Prior research has indicated that adolescents varied in their perceived relationship about the time periods (Cottle, 1967). Moreover, this research demonstrated that adolescents were able to understand a measure of perceived temporal relationships that used circular images. Another study with adolescents indicated that more than a third perceived the time periods as interconnected, followed by those who perceived only the present and future as related (Mello et al., 2013). The subsequent group perceived the time periods as linearly connected (the past related to the present, and the present related to the future), and the smallest group perceived time as unrelated. This research has also shown that outcomes that are key for adolescent development varied by time relation. Specifically, participants who perceived two or more time periods (e.g., present and future) as related indicated greater academic achievement, hope, and less risky behavior than those who perceived time as unrelated.

2.2. Moderating effect on bullying victimization and self-esteem

Research has shown that time perspective is associated with positive outcomes in adolescents who have faced adversities, highlighting its potential “protective” effect. Research has shown that among runaway adolescents, those who endorsed more favorable time feelings (greater positivity and lower negativity about time) also indicated greater self-esteem (Mello et al., 2018). This research also demonstrated that runaway adolescents who perceived the time periods to be related to one another (time relation) also indicated greater self-esteem than those who perceived time as unrelated. Another study showed that among high-risk adolescents, those with greater orientation toward the future were more likely to indicate a positive improvement in their lives after experiencing stressful life events, such as family conflicts and financial hardships (Arpawong et al., 2016).

Previous research investigating the moderating effect of other temporal constructs suggest a similar effect of time perspective. For instance, self-continuity—the perception that one’s past, present, and future selves are the same—moderated the association between traditional bullying victimization and depressed affect in early adolescents (Santo et al., 2018). Specifically, those with a lot of traditional bullying victimization who indicated a strong sense of self-continuity also indicated less depressed affect than their counterparts with a weak sense of self-continuity. Another study including adolescents and adults indicated that rumination, which includes a focus on the past, moderated the effect of cyberbullying victimization on psychological well-being (Zsila et al., 2018). Combined, these studies provide some evidence that time perspective may moderate the association between bullying victimization and self-esteem.

Research on time perspective has not yet explicitly considered the possible mechanisms connecting the construct to outcomes that are key for adolescent development, such as self-esteem. One potential mechanism underlying the moderating effect of time perspective on bullying victimization and self-esteem may be identity formation. This notion is supported by a study that has shown how time perspective is associated with identity exploration and commitment (Luyckx et al., 2010). Adolescents with time perspectives that are associated with a more stable and secure sense of identity may be less vulnerable to the negative effects of bullying victimization on self-esteem.

2.3. The present studies

We conducted two studies to examine the moderating effects of time perspective dimensions (feelings, frequency, and relation) on the associations between two forms of bullying victimization (traditional and cyber) and self-esteem in adolescents. Studies 1 and 2 examined traditional bullying victimization and cyberbullying victimization, respectively, and investigated three research questions. First, how do time feelings moderate the associations between traditional and cyberbullying victimization and self-esteem in adolescents? Second and third, how do time frequency and time relation moderate these associations? These time perspective dimensions were expected to be moderators given research that showed similar effects with related associations (Zsila et al., 2018). Specifically, the associations between traditional and cyberbullying victimization and self-esteem were hypothesized to be moderated in adolescents who had strong positive and weak negative feelings about the past, present, and future (time feelings); thought a little about the past and a lot about the present or future (time frequency); and perceived all time periods to be related to one another (time relation).

3. General method

3.1. Participants and procedures

Participants were recruited from public high schools in the western United States. Study 1 included two schools, whereas Study 2 included one school. Each school had about 1500 enrolled students from grades 9 through 12 and were geographically close. The schools varied in free lunch eligibility rates (i.e., 22%–77%). To our knowledge, no bullying prevention programs were being implemented during data collection.

Trained researchers visited classrooms during school hours and delivered recruitment speeches. Students who were interested in participating received a printed set of study materials that included a parental consent form, a participant assent form, and the study survey. Participants filled out the study survey on their own time and returned it to the researchers on site. To preserve anonymity, a separate envelope was provided for the submission of the completed survey. Participants were compensated with \$10 in Study 1 and with pizza in Study 2. Estimated survey return rates were 68% and 25%, respectively. The institutional review board of the university affiliated with the two studies approved the procedures (Study 1: H15-33c; Study 2: X17-30).

In Studies 1 and 2, the following participants were excluded from analyses given the small subsample sizes: those who (a) were older than 18 years of age, (b) identified as other than female or male, or (c) did not provide their age or gender ($n = 88$). Specifically, 16 (2%) participants in Study 1 and 8 (2%) participants in Study 2 identified their gender as other than female and male. Analyses of missing data on key study variables (traditional bullying victimization, cyberbullying victimization, time perspective, and self-esteem) indicated that in Study 1, participants were missing one ($n = 43$, 6%) or more ($n = 60$, 8%) item responses. Participants with missing responses thought less frequently about the future ($M = 3.78$, $SD = 1.14$) than their counterparts ($M = 4.12$, $SD = 0.89$; $p < .001$). In Study 2, participants were missing one ($n = 14$, 7%) or more ($n = 8$, 4%) item responses. Participants with missing responses reported greater cyberbullying victimization ($M = 1.81$, $SD = 1.37$) than their counterparts ($M = 1.21$, $SD = 0.48$; $p < .001$). In both studies, participants with missing responses did not differ in self-esteem from their counterparts ($ps \geq .75$). Pairwise deletion was used for correlational analyses and listwise deletion for other analyses. Data were analyzed using Stata (Version 14).

4. Study 1

4.1. Method

4.1.1. Participants

The sample consisted of 721 adolescents aged 12–18 years ($M_{age} = 15.84$, $SD = 1.20$; 57% female). Participants were students in the 6th (<1%), 9th (31%), 10th (10%), 11th (38%), and 12th (21%) grades. Participants included African Americans/Blacks (6%), American Indians/Alaskan Natives (<1%), Asian Americans/Pacific Islanders (20%), European Americans/Whites (17%), Hispanics/Latino(a) Americans (43%), those of multiple races/ethnicities (11%), of other race/ethnicity (3%), and those who did not respond (<1%). Maternal education was assessed as proxy for socioeconomic status (Diemer et al., 2013), and the sample average was below an Associate's degree.

4.1.2. Measures

Traditional bullying victimization. Traditional bullying victimization was assessed with the Adolescent Peer Relations Instrument: Target ($M = 1.50$, $SD = 0.85$; $\alpha = 0.97$; Marsh et al., 2011). The scale included 18 items (“*I was pushed or shoved*”). Response options ranged from 1 (*never*) to 6 (*every day*). Composite scores were generated by averaging the responses, with higher scores indicating greater levels of traditional bullying victimization. In prior research with adolescent participants, this measure has yielded valid and reliable scores (Marsh et al., 2011).

Self-esteem. Self-esteem was measured with the Rosenberg Self-Esteem Scale ($M = 2.85$, $SD = 0.56$; $\alpha = 0.85$; Rosenberg, 1965). The scale contained 10 items (“*On the whole, I am satisfied with myself*”), with response options ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Self-esteem scores were determined by averaging the responses, with higher scores representing greater self-esteem. The measure has been used extensively with adolescents (Aunola et al., 2000).

Time perspective. The Adolescent and Adult Time Inventory (Mello & Worrell, 2007) was used to measure time feelings, time frequency, and time relation.

Time feelings. Time feelings were assessed with six five-item subscales that separately measured positive and negative feelings about the past, present, and future: Past Positive ($M = 3.40$, $SD = 0.78$; $\alpha = 0.82$; “*I have very happy memories of my childhood*”), Past Negative ($M = 2.72$, $SD = 0.89$; $\alpha = 0.85$; “*I am not satisfied with my past*”), Present Positive ($M = 3.43$, $SD = 0.74$; $\alpha = 0.85$; “*I am happy with my current life*”), Present Negative ($M = 2.67$, $SD = 0.82$; $\alpha = 0.85$; “*I have negative feelings about my current situation*”), Future Positive ($M = 3.70$, $SD = 0.81$; $\alpha = 0.87$; “*I look forward to my future*”), and Future Negative ($M = 2.37$, $SD = 0.84$; $\alpha = 0.83$; “*I don't like to think about my future*”). Response options ranged from 1 (*totally disagree*) to 5 (*totally agree*). Subscale responses were averaged to create six time feelings scores, with higher scores indicating greater positive or negative feelings. Previous studies have shown support for a six-factor structure for the variable and its construct validity (Worrell et al., 2013; Worrell & Mello, 2009).

Time frequency. Time frequency was assessed with one item for each time period, totaling three items. Participants were asked how often they thought about the past ($M = 3.48$, $SD = 0.94$), present ($M = 3.77$, $SD = 0.99$), and future ($M = 4.08$, $SD = 0.94$). Response options ranged from 1 (*almost never*) to 5 (*almost always*). An earlier version of these items was associated with risky behavior (Mello et al., 2019).

Time relation. A single item assessed time relation (see Table 2). This item included four figures that depicted the past, present, and future as circles, with the overlapping of circles indicating a relationship. Participants were asked to select one figure that represented how they perceived the time periods to be related to one another. Figures represented the following time relation types: unrelated (all the time periods are unrelated), present-future (the present and future are related), linear (the past is related to the present, and the present is related to the future), and interrelated (all of the time periods are related to one another). This measure has been used in recent studies examining adolescent time perspectives (Finan et al., 2020; Haldeman, 1992). Additional studies have indicated time relation's associations with risky behavior and hope in adolescents (Mello et al., 2013). Specifically, participants who perceived time as unrelated reported more risky behaviors and less hope than those who perceived time as related (e.g., interrelated).

Covariates. Traditional bullying ($M = 1.42$, $SD = 0.71$; $\alpha = 0.95$; Adolescent Peer Relations Instrument: Bully; Marsh et al., 2011) was included as a covariate, as some adolescents are involved in *both* traditional bullying victimization and perpetration (Copeland et al., 2013). Age, gender, race/ethnicity, and maternal education were also assessed as covariates because of their associations with bullying victimization (Cook et al., 2010; Ronis & Slaunwhite, 2019; Xu et al., 2020). In addition, high school membership was controlled given that several schools participated.

Table 1

Correlations and descriptive statistics for traditional bullying victimization, cyberbullying victimization, self-esteem, time feelings, and time frequency in adolescents.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Traditional Bullying Victimization	–	N/A	-.21***	-.13***	.21***	-.11**	.17***	-.14***	.20***	-.02	-.12**	-.12**
2. Cyberbullying Victimization	N/A	–	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3. Self-Esteem	N/A	-.14	–	.35***	-.43***	.56***	-.60***	.43***	-.54***	-.15***	.17***	.09*
<i>Time Feelings</i>												
4. Past Positive	N/A	-.14	.46***	–	-.54***	.47***	-.24***	.30***	-.12**	.00	.16***	.13***
5. Past Negative	N/A	.25***	-.53***	-.74***	–	-.31***	.52***	-.07	.41***	.21***	-.07	-.01
6. Present Positive	N/A	-.12	.67***	.48***	-.45***	–	-.64***	.55***	-.34***	-.09*	.22***	.09*
7. Present Negative	N/A	.21**	-.71***	-.44***	.55***	-.80***	–	-.33***	.57***	.28***	-.05	.04
8. Future Positive	N/A	-.15*	.48***	.32***	-.29***	.57***	-.49***	–	-.54***	.06	.19***	.32***
9. Future Negative	N/A	.23**	-.57***	-.37***	.44***	-.53***	.57***	-.73***	–	.09*	-.16***	-.16***
<i>Time Frequency</i>												
10. Past Frequency	N/A	-.12	-.26***	.05	.08	-.15*	.19**	-.08	.10	–	.29***	.25***
11. Present Frequency	N/A	-.03	.07	.09	-.06	.18*	-.13	.01	-.06	.01	–	.31***
12. Future Frequency	N/A	-.09	-.14	-.07	.04	-.15*	.11	.15*	-.14	.31***	.14*	–
Study 1												
Mean	1.50	N/A	2.85	3.40	2.72	3.43	2.67	3.70	2.37	3.48	3.77	4.08
SD	.85	N/A	.56	.78	.89	.74	.82	.81	.84	.94	.99	.94
Min, Max	1, 6	N/A	1.30, 4	1, 5	1, 5	1.20, 5	1, 5	1, 5	1, 5	1, 5	1, 5	1, 5
Study 2												
Mean	N/A	1.26	2.78	3.57	2.52	3.46	2.65	3.64	2.38	3.53	4.02	4.07
SD	N/A	.63	.62	.76	.86	.80	.86	.77	.78	.85	.84	.87
Min, Max	N/A	1, 6	1.10, 4	1, 5	1, 5	1, 5	1, 5	1, 5	1, 4.60	1, 5	1, 5	1, 5

Note. Correlations for Studies 1 and 2 are in the top and bottom panels, respectively. N/A = not available.

* $p < .05$. ** $p < .01$. *** $p < .001$.

4.2. Results

4.2.1. Preliminary analyses

Descriptive statistics are displayed in Table 1. Correlational analysis indicated that traditional bullying victimization was negatively associated with self-esteem, positive time feelings, and time frequency and was positively associated with negative time feelings. About a third of the participants endorsed the present-future, linear, or interrelated relations (Table 2).

4.2.2. Moderating effect of time perspective on traditional bullying victimization and self-esteem

Hierarchical linear regression analyses (Tabachnick, 2007) demonstrated a direct negative relationship between traditional bullying victimization and self-esteem and the moderation of this association by time perspective (see Appendix A for the full models). In all models, step 1 included the covariates: age, gender, high school, maternal education, race/ethnicity, and traditional bullying; step 2 included traditional bullying victimization and the time perspective dimensions; and step 3 included interaction terms. Continuous predictor variables were mean-centered. Alpha adjustments were made for analyses with time feelings (e.g., past positive; $\alpha < 0.008$) and time frequency (e.g., past frequency; $\alpha < 0.017$).

Time feelings. Time feelings moderated the association between traditional bullying victimization and self-esteem (see Table 3; upper portion). Fig. 1 shows the simple slopes for these moderating effects. Drawing from Aiken and West (1991), the x-axes ranged from the lowest observed value for traditional bullying victimization to 1 SD above the mean, and the y-axes displayed the full self-esteem scale. Results showed that positive feelings about the present and future moderated the association between traditional bullying victimization and self-esteem. Simple slopes analysis indicated that adolescents with a lot of traditional bullying victimization (i.e., 1 SD above the mean) who reported strong positive feelings about the present and future also reported higher self-esteem than their counterparts with weak positive feelings about these time periods (see Fig. 1a). Results further showed that negative feelings about the present and future moderated the association between traditional bullying victimization and self-esteem. Simple slopes analysis indicated that adolescents with a lot of traditional bullying victimization who also reported weak negative feelings about the present and future were associated with greater self-esteem than their counterparts with strong negative feelings about these time periods (see Fig. 1b).

Time frequency. Time frequency (past) moderated the association between traditional bullying victimization and self-esteem (Table 3). Simple slopes analysis showed that adolescents with a lot of traditional bullying victimization who reported thinking a lot about the past also reported lower self-esteem than their counterparts who thought a little about the past (see Fig. 1c).

Time relation. Time relation moderated the association between traditional bullying victimization and self-esteem (see Table 3). Simple slopes analysis showed that adolescents with a lot of traditional bullying victimization who perceived time as interrelated also reported greater self-esteem than their counterparts who perceived time as unrelated or present-future related (see Fig. 1d).






5. Study 2

5.1. Method

5.1.1. Participants

The sample included 190 adolescents aged 14–18 years ($M_{age} = 15.83$, $SD = 1.28$; 59% female). Participants were students in the 9th (32%), 10th (28%), 11th (21%), and 12th (19%) grades. Participants included African Americans/Blacks (2%), Asian Americans/

Table 2
Distribution of time relation and its association with self-esteem in adolescents.

Time Relation ^a		Study 1		Study 2	
		Distribution	Self-Esteem	Distribution	Self-Esteem
		% ^c	<i>M</i> (<i>SD</i>)	% ^c	<i>M</i> (<i>SD</i>)
Unrelated		10	2.74 (.63)	4	2.97 (.57)
Present-Future		29	2.85 (.57)	23	2.95 (.52)
Past-Present ^b		N/A	N/A	12	2.64 (.61)
Linear		27	2.91 (.53)	26	2.71 (.67)
Interrelated		33	2.82 (.57)	35	2.75 (.68)
<i>F</i>			1.68		1.29
η^2			.01		.03

Note. Bonferroni tests were used for comparisons and no differences were observed. N/A = not available.

^a Response option labels were included for clarity and were not displayed on the instrument.

^b Past-present type was included in Study 2 only.

^c Percentages may not sum to 100 due to rounding.

Table 3

Hierarchical linear regression models for traditional bullying victimization, time perspective, and self-esteem in adolescents.

Model	Variable (Step 3)	Self-Esteem					
		<i>b</i>	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> ² _{adj}	ΔR^{2a}
		Time Feelings ^b					
1	Traditional Bullying Victimization	-.12***	-.18	.03	18.32***	.19	.004
	Past Positive	.25***	.36	.03			
	TBV × Past Positive	-.04	-.07	.02			
2	Traditional Bullying Victimization	-.10**	-.15	.03	22.22***	.23	.002
	Past Negative	-.25***	-.40	.02			
	TBV × Past Negative	.03	.05	.02			
3	Traditional Bullying Victimization	-.12***	-.18	.03	46.61***	.38	.016***
	Present Positive	.42***	.56	.02			
	TBV × Present Positive	-.09***	-.13	.02			
4	Traditional Bullying Victimization	-.10***	-.16	.03	51.94***	.41	.016***
	Present Negative	-.40***	-.59	.02			
	TBV × Present Negative	.08***	.14	.02			
5	Traditional Bullying Victimization	-.13***	-.20	.03	27.94***	.27	.008**
	Future Positive	.32***	.46	.02			
	TBV × Future Positive	-.06**	-.09	.02			
6	Traditional Bullying Victimization	-.11***	-.17	.03	38.17***	.34	.013***
	Future Negative	-.36***	-.54	.02			
	TBV × Future Negative	.07***	.13	.02			
		Time Frequency ^b					
7	Traditional Bullying Victimization	-.14***	-.21	.03	9.06***	.10	.010**
	Past Frequency	-.09***	-.16	.02			
	TBV × Past Frequency	.05**	.10	.02			
8	Traditional Bullying Victimization	-.13***	-.21	.03	8.41***	.09	.000
	Present Frequency	.08***	.15	.02			
	TBV × Present Frequency	.00	.00	.02			
9	Traditional Bullying Victimization	-.14***	-.22	.03	7.39***	.08	.001
	Future Frequency	.05*	.08	.02			
	TBV × Future Frequency	-.01	-.03	.02			
		Time Relation					
10	Traditional Bullying Victimization	-.05	-.08	.05	6.26***	.10	.020**
	Time Relation						
	Unrelated	-.04	-.02	.08			
	Present-Future	.02	.02	.06			
	Linear	.10	.08	.06			
	Interrelated						
	Reference Category						
	TBV × Time Relation						
	TBV × Unrelated	-.25**	-.14	.09			
	TBV × Present-Future	-.22**	-.17	.07			
		Reference Category					
	TBV × Linear	-.09	-.07	.07			
	TBV × Interrelated						

Note. Step 1 included covariates (age, gender, high school, maternal education, race/ethnicity, and traditional bullying); step 2 included traditional bullying victimization and time perspective dimensions; and step 3 included main effects and interaction terms (shown). Steps 1 and 2 are available in Appendix A. Continuous predictors were mean-centered. TBV = traditional bullying victimization; N/A = not available.

* $p < .05$. ** $p < .01$. *** $p < .001$.

^a Values indicate change in R^2 from step 2 to step 3.

^b The following alpha levels were used to test for statistical significance: $\alpha < 0.008$ for time feelings and $\alpha < 0.017$ for time frequency.

Pacific Islanders (32%), European Americans/Whites (32%), Hispanics/Latino(a) Americans (9%), those of multiple races/ethnicities (23%), and those who did not respond (3%). The sample average maternal education was just below a Bachelor's degree.

5.1.2. Measures

The same measures from Study 1 were employed to assess self-esteem ($M = 2.78$, $SD = 0.62$; $\alpha = 0.89$), time feelings (past positive [$M = 3.57$, $SD = 0.76$; $\alpha = 0.84$], past negative [$M = 2.52$, $SD = 0.86$; $\alpha = 0.85$], present positive [$M = 3.46$, $SD = 0.80$; $\alpha = 0.89$], present negative [$M = 2.65$, $SD = 0.86$; $\alpha = 0.86$], future positive [$M = 3.64$, $SD = 0.77$; $\alpha = 0.87$], and future negative [$M = 2.38$, $SD = 0.78$; $\alpha = 0.78$]), and time frequency (past [$M = 3.53$, $SD = 0.85$], present [$M = 4.02$, $SD = 0.84$], and future [$M = 4.07$, $SD = 0.87$]). Time relation was measured with a revised version of the item used in Study 1 that included a past-present relation (the past and present are related; see Table 2).

Cyberbullying victimization. Cyberbullying victimization was assessed with the 15-item Adolescent Cyberbullying Scale: Target ($M = 1.26$, $SD = 0.63$; $\alpha = 0.96$; Seril et al., 2019). For example, participants were asked how often “someone sent mean text messages, photos, or videos to you.” Response options ranged from 1 (never) to 6 (every day). Cyberbullying victimization scores were generated by averaging the responses, with higher scores indicating greater cyberbullying victimization.

Covariates. Covariates from Study 1 except high school membership were used because only one school was included.

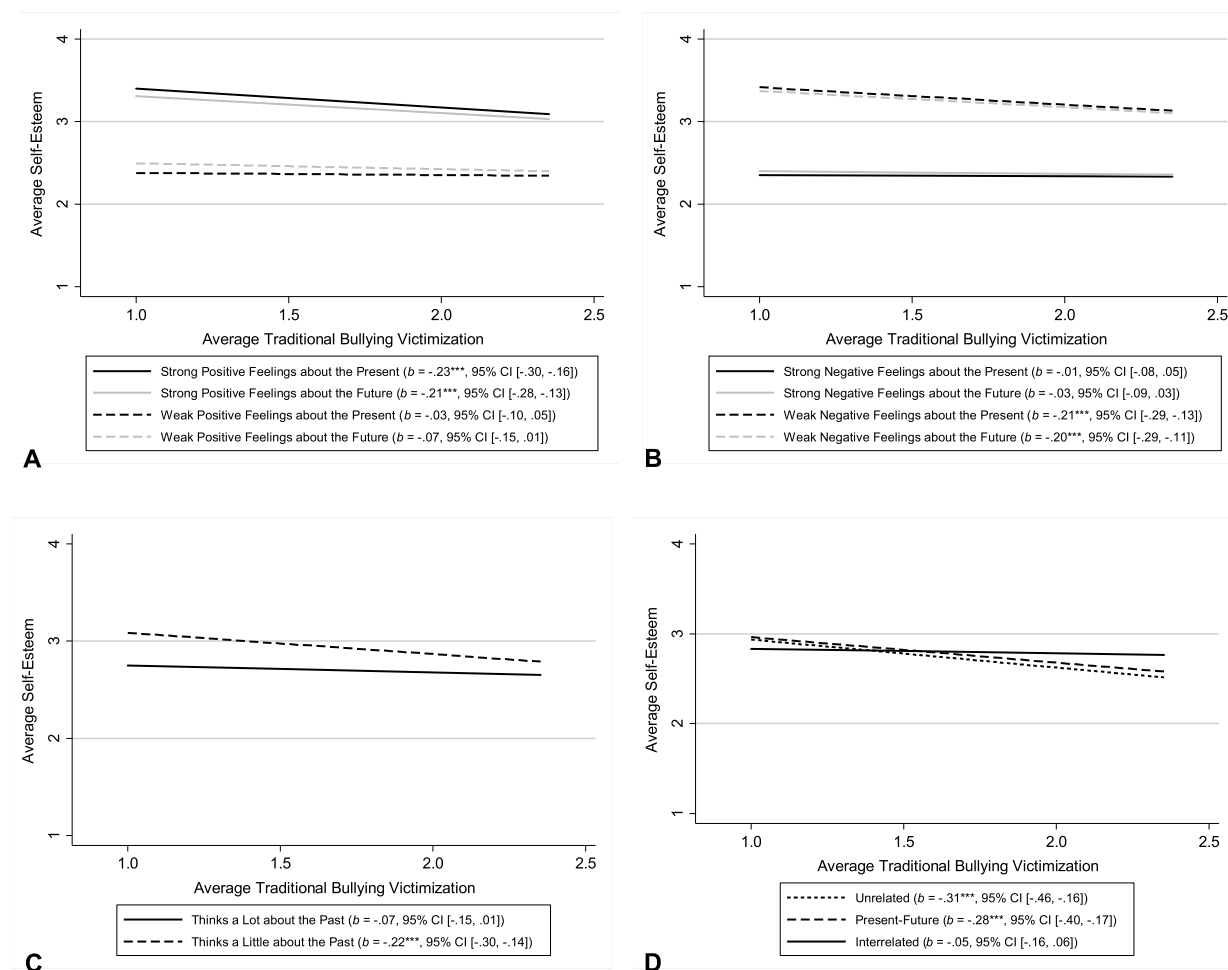


Fig. 1. Estimated interactions between traditional bullying victimization and time perspective (positive time feelings [A], negative time feelings [B], past time frequency [C], and time relation [D]). Values were estimated with ± 1.5 SD from the mean. Unstandardized coefficients, p -values, and 95% confidence intervals for the simple slopes are located in the legends. Age, gender, high school, maternal education, race/ethnicity, and traditional bullying were controlled.

*** $p < .001$.

Cyberbullying ($M = 1.24$, $SD = 0.67$; $\alpha = 0.97$; Adolescent Cyberbullying Scale: Bully; Seril et al., 2019) was also controlled given its association with self-esteem (Kowalski et al., 2014).

5.2. Results

5.2.1. Preliminary analyses

Table 1 displays descriptive statistics. Correlational analysis indicated that cyberbullying victimization was positively associated with negative time feelings and negatively associated with positive feelings for the future. Table 2 shows the percentage distribution of the time relation types.

5.2.2. Moderating effect of time perspective on cyberbullying victimization and self-esteem

Hierarchical linear regression analyses demonstrated a direct negative relationship between cyberbullying victimization and self-esteem and the moderation of this association by time feelings and time frequency (see Appendix B for the full models). In all models, step 1 included the covariates: age, gender, maternal education, race/ethnicity, and cyberbullying; step 2 included cyberbullying victimization and the time perspective dimensions; and step 3 included interaction terms. Continuous predictor variables were mean-centered. Alpha adjustments were made to account for time feelings ($\alpha < 0.008$) and time frequency ($\alpha < 0.017$).

Time feelings. Negative feelings about the present and future moderated the association between cyberbullying victimization and self-esteem (see Table 4). Fig. 2 shows the simple slopes for these moderating effects. Drawing from Aiken and West (1991), the x-axes ranged from the lowest observed value for cyberbullying victimization to 1 SD above the mean, and the y-axes displayed the full

self-esteem scale. Simple slopes analysis showed that adolescents with a lot of cyberbullying victimization (i.e., 1 *SD* above the mean) who reported weak negative feelings about the present and future also had higher self-esteem than their counterparts with strong negative feelings about these time periods (see Fig. 2).

Time frequency. Time frequency (future) moderated the association between cyberbullying victimization and self-esteem. Simple slopes analysis showed that the negative association between cyberbullying victimization and self-esteem was weaker for adolescents who reported thinking a lot about the future compared to their counterparts who thought a little about the future.

6. Discussion

Adolescents who experience bullying victimization struggle with psychosocial adjustment and psychological health, including low self-esteem (e.g., Cénat et al., 2014). The pervasive and harmful influence of bullying victimization calls for research efforts that identify factors that mitigate this negative impact. Time perspective—feelings and thoughts about our past, present, and future

Table 4
Hierarchical linear regression models for cyberbullying victimization, time perspective, and self-esteem in adolescents.

Model	Variable (Step 3)	Self-Esteem					
		<i>b</i>	<i>B</i>	<i>SE</i>	<i>F</i>	<i>R</i> ² _{adj}	Δ <i>R</i> ^{2a}
		Time Feelings ^b					
1	Cyberbullying Victimization	-.54**	-.55	.18	7.22***	.24	.007
	Past Positive	.34***	.41	.06			
	CBV × Past Positive	-.14	-.10	.11			
2	Cyberbullying Victimization	-.53**	-.54	.19	8.93***	.28	.015
	Past Negative	-.34***	-.46	.05			
	CBV × Past Negative	.20	.18	.11			
3	Cyberbullying Victimization	-.26	-.26	.16	16.28***	.43	.005
	Present Positive	.48***	.62	.05			
	CBV × Present Positive	-.13	-.08	.11			
4	Cyberbullying Victimization	-.33	-.34	.15	22.47***	.52	.016*
	Present Negative	-.49***	-.68	.04			
	CBV × Present Negative	.21	.18	.09			
5	Cyberbullying Victimization	-.42	-.43	.18	8.52***	.27	.000
	Future Positive	.40***	.48	.06			
	CBV × Future Positive	.01	.00	.16			
6	Cyberbullying Victimization	-.45**	-.46	.15	14.09***	.40	.022*
	Future Negative	-.49***	-.60	.05			
	CBV × Future Negative	.17	.18	.07			
		Time Frequency ^b					
7	Cyberbullying Victimization	-.64***	-.65	.18	4.87***	.16	.005
	Past Frequency	-.27***	-.34	.06			
	CBV × Past Frequency	.08	.07	.08			
8	Cyberbullying Victimization	-.61**	-.63	.19	2.12	.05	.004
	Present Frequency	.04	.05	.06			
	CBV × Present Frequency	-.09	-.06	.11			
9	Cyberbullying Victimization	-.65**	-.66	.18	3.57***	.11	.030*
	Future Frequency	-.15*	-.20	.06			
	CBV × Future Frequency	.22*	.19	.10			
		Time Relation					
10	Cyberbullying Victimization	-.74**	-.53	.23	2.36**	.10	.006
	Time Relation						
	Unrelated	.07	.02	.25			
	Present-Future	.28*	.18	.14			
	Past-Present	-.10	-.05	.17			
	Linear	-.15	-.11	.16			
	Interrelated						
	Reference Category						
	CBV × Time Relation						
	CBV × Unrelated ^c	N/A					
		Reference Category					
	CBV × Present-Future	.14	.07	.25			
	CBV × Past-Present	.17	.03	.54			
	CBV × Linear	-.45	-.08	.60			
	CBV × Interrelated						

Note. Step 1 included covariates (age, gender, maternal education, race/ethnicity, and cyberbullying); step 2 included cyberbullying victimization and time perspective dimensions; and step 3 included main effects and interaction terms (shown). Steps 1 and 2 are available in Appendix B. Continuous predictors were mean-centered. CBV = cyberbullying victimization; N/A = not available.

p* < .05. *p* < .01. ****p* < .001.

^a Values indicate change in *R*² from step 2 to step 3.

^b The following alpha levels were used to test for statistical significance: α < 0.008 for time feelings and α < 0.017 for time frequency.

^c The interaction term between cyberbullying victimization and the unrelated type was omitted from the model due to collinearity.

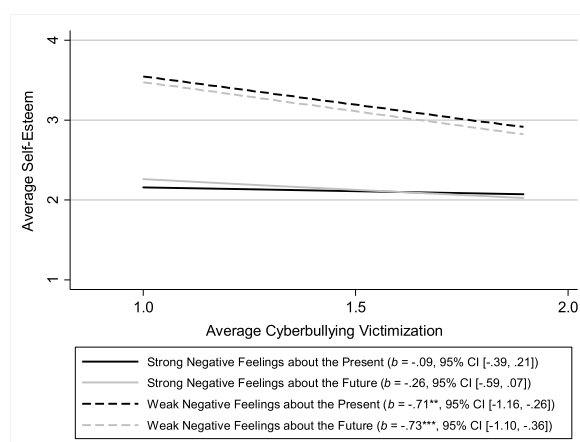


Fig. 2. Estimated interactions between cyberbullying victimization and negative time feelings about the present and future. Values were estimated with ± 1.5 SD from the mean. Unstandardized coefficients, p -values, and 95% confidence intervals for the simple slopes are located in the legend. Age, gender, maternal education, race/ethnicity, and cyberbullying were controlled.

** $p < .01$. *** $p < .001$.

(Zimbardo & Boyd, 1999)—may be a potential factor. In the current studies, time perspective dimensions were examined as moderators of the associations between traditional and cyberbullying victimization and self-esteem.

6.1. Time perspective moderated the association between bullying victimization and self-esteem

Results showed that multiple time perspective dimensions (feelings, frequency, and relation) moderated the association between traditional bullying victimization and self-esteem. These findings extend past research that showed how thoughts about the future and time feelings were associated with healthy outcomes in adolescents experiencing adversities (Arpawong et al., 2016; Mello et al., 2018) by demonstrating similar patterns with multiple time perspective dimensions.

With regard to cyberbullying victimization, negative time feelings moderated its association with self-esteem. One explanation for the lack of moderating effects is that the cyberbullying victimization measure used in the study may not have adequately captured incidents occurring on digital platforms such as social networking apps or online games; such incidents have been reported in prior studies (Whittaker & Kowalski, 2015). A second explanation is that the perceived impact of cyberbullying victimization may have different implications than its frequency. For instance, a mean text sent to an entire school would presumably have greater impact on the targeted adolescent than a text sent to a few classmates. Past studies examining a topic similar to perceived impact have shown that adolescents who recalled feeling more upset when they experienced cyberbullying victimization indicated more psychological difficulties than their counterparts (Görzig & Frumkin, 2013; Vandoninck et al., 2013).

6.2. The potential utility of time perspective-based interventions

Findings showed that a greater emphasis on the future and less on the past moderated the negative association between bullying victimization and self-esteem. These results suggest that adolescents who think about new social environments and opportunities in their future rather than dwell on past experiences of being bullied may be more resilient against bullying victimization. These findings also suggest that interventions addressing bullying victimization with time perspective could be more effective using a multidimensional and multi-temporal approach than focusing on one time perspective dimension or time period alone. Accordingly, interventions promoting college and career preparedness and strategies for reducing ruminative thoughts may mitigate bullying victimization's negative effect on self-esteem. Indeed, past studies have shown that interventions targeting time perspective can promote thinking about the future and improve attitudes toward career planning (Hall & Fong, 2003; Marko & Savickas, 1998).

Given the associations between time perspective and identity processes (Luyckx et al., 2010), preventative interventions may also utilize synergistic strategies to promote ideal time perspectives and identity formation to protect against the negative effects of bullying victimization on self-esteem. Importantly, early adolescence may be a developmental period that is particularly effective for interventions. Early adolescents are especially vulnerable to bullying victimization (see Hymel & Swearer, 2015, for a review), and this developmental period includes challenges associated with the transition from middle to high school.

6.3. Time perspective's multidimensional and multi-temporal qualities

The current studies examined separate time perspective dimensions (feelings, frequency, and relation) across multiple time periods (past, present, and future), yielding a more nuanced understanding of time perspective's moderation of the association between bullying victimization and self-esteem. For example, findings showed that how positively one felt about the present (time feelings) and

how one perceived the present to be related to other time periods (time relation) were both moderators. Moreover, the multi-temporal approach highlighted the relative influence of the time periods. For instance, feelings about the present and future moderated the association between traditional bullying victimization and self-esteem, whereas feelings about the past did not. This suggests that how one feels about the present and future has a greater influence on this association than that of feelings about the past. This finding is supported by prior research that showed that adolescents who favored the present and future over the past indicated greater self-esteem than those who favored the future only or the past and future (Mello et al., 2013). Overall, the multidimensional and multi-temporal aspects of time perspective enable a more comprehensive examination of the moderating role of time perspective on the association between bullying victimization and self-esteem.

6.4. Limitations and future directions

The current investigation included limitations. Convenience samples were used, which can be addressed by using samples that are larger, more diverse, or nationally representative. Further, the return rate for Study 2 was lower than that of Study 1. This may be due to the difference in compensation (i.e., pizza versus \$10, respectively). Moreover, the cross-sectional study design prohibited the examination of the directionality of the associations among time perspective dimensions, traditional and cyberbullying victimization, and self-esteem. Additional studies may examine these variables at multiple time points (e.g., at the beginning and at the end of a school year) to indicate the directions of these associations.

Future directions of this research include examining other potential moderators that have been shown to be associated with bullying victimization in adolescents, such as age and race/ethnicity (Cook et al., 2010; Xu et al., 2020). Relatedly, given the prevalence of bias-based bullying (i.e., based on stigmatized identities such as race/ethnicity; see Xu et al., 2020, for a review), it would be useful for future research to focus on racial/ethnic minority groups. Future studies could also take a person-centered approach and examine time perspective dimensions concurrently, given that separate dimensions had moderating effects on bullying victimization and self-esteem. This approach may identify ideal time perspective profiles that maximize the moderating effect. Lastly, future research could investigate whether the patterns observed in this study replicate in an online learning environment. Specifically, it may be particularly useful to examine potential shifts in cyberbullying victimization and time perspective in remote learning. In these ways, time perspective could have even more implications for practitioners and other professionals who promote adolescent mental health.

7. Conclusion

The moderating effect of time perspective on the associations between two forms of bullying victimization (traditional and cyber) and self-esteem was examined in adolescents. Multiple time perspective dimensions (feelings, frequency, and relation) and time periods (past, present, and future) were considered. Results indicated that the associations between traditional and cyberbullying victimization and self-esteem were influenced by time perspective. Specifically, these associations were moderated in adolescents who indicated (a) having strong positive and weak negative feelings about the present and future (time feelings); (b) thinking a little about the past (time frequency); and (c) perceiving all time periods as interrelated (time relation). These findings illustrate the potential role of time perspective in interventions for reducing the negative impact of bullying victimization in adolescents. Further, these findings demonstrate the multidimensional and multi-temporal qualities of time perspective.

Appendices A and B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.adolescence.2021.05.002>.

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Declarations of competing interest

None.

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