

# Time Attitude Profiles and Risky Behaviors Among Adolescents in the United States and Germany

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## **Abstract**

We used a person-centered approach to examine associations among time attitude profiles –positive and negative feelings about the past, present, and future – and risky behaviors. Participants were adolescents from the U.S. and Germany. The U.S. sample included 742 participants ( $M_{\text{Age}} = 15.71$ ; 53.6% female). The German sample included 610 participants ( $M_{\text{Age}} = 14.75$ ; 51.4% female). Latent profile analyses supported three more adaptive (Positive, Balanced, and Optimists) and two less adaptive (Ambivalent, Extremely Past Negative) time attitude profiles in both samples. In the U.S., adolescents in the Positive profile reported fewer risky behaviors than their counterparts. In Germany, adolescents in the Extremely Past Negatives profile reported more risky behaviors than their counterparts. Findings support the investigation of time attitudes as a meaningful correlate of risky behaviors in adolescents and across cultures.

**Keywords:** time perspective, time attitudes, risky behaviors, adolescents, United States, Germany, Latent Profile Analysis

## *Zeitperspektiven und Risikoverhalten bei Jugendlichen in den Vereinigten Staaten und Deutschland*

### **Zusammenfassung**

Um Zusammenhänge zwischen Zeiteinstellungsprofilen – positive und negative Gefühle in Bezug auf die Vergangenheit, die Gegenwart und die Zukunft – und riskanten Verhaltensweisen zu untersuchen, haben wir einen personenzentrierten Ansatz gewählt. Die Stichprobe bestand aus Jugendlichen aus den USA und aus Deutschland. Die U.S.-Stichprobe umfasste 742 Teilnehmende ( $M_{\text{Alter}} = 15,71$ ; 53,6 % weiblich). Die deutsche Stichprobe umfasste 610 Teilnehmende ( $M_{\text{Alter}} = 14,75$ ; 51,4 % weiblich). Latente Profilanalysen verweisen in beiden Stichproben auf drei adaptivere (Positive, Ausgeglichene und Optimistische) und zwei weniger adaptive (Ambivalente, Extrem-Vergangenheits-Negativ-Orientierte) Einstellungsprofile. In den USA berichteten Jugendliche mit positiven Profilen von weniger riskanten Verhaltensweisen im Vergleich zu ihren Gleichaltrigen. In Deutschland berichteten Jugendliche im Profil der Extrem-Vergangenheits-Negativ-Orientierten von riskanteren Verhaltensweisen als ihre Gleichaltrigen. Die Ergebnisse unterstützen die Nutzung von Einstellungsprofilen im Kontext der Zeitperspektiven als sinnvolles Korrelat riskanter Verhaltensweisen bei Jugendlichen und über verschiedene Kulturen hinweg.

**Schlüsselwörter:** Zeitperspektive, Zeiteinstellungen, riskantes Verhalten, Jugendalter, USA, Deutschland, latente Profilanalyse

Time perspective is a multidimensional construct that includes thoughts and feelings about the past, present, and future (Mello, 2019; Mello & Worrell, 2015; Stolarski et al., 2015; Zimbardo & Boyd, 1999). Dimensions focused on thoughts include the orientation one has for a particular time period (Cottle, 1967), whereas dimensions focused on feelings include time attitudes, defined as positive and negative emotions for each time period (Andretta et al., 2014; McKay et al., 2021; Prow et al., 2016; Worrell et al., 2013). Studies examining time attitudes have revealed robust relationships between time attitudes and key indicators of developmental outcomes. For example, researchers have used bivariate analytic approaches to show how time attitudes are associated with academic achievement (Yacob et al., 2020; Zimbardo & Boyd, 1999), substance use (Apostolidis et al., 2006; Finan et al., 2021; Wells, Morgan, et al., 2018), psychological well-being, such as anxiety, optimism, and self-esteem (Konowalczyk, Buhl, et al., 2019), and risky behaviors (Mello et al., 2019).

More recently, researchers have turned to person-oriented analytic strategies (Bergman & Magnusson, 1997; Bergman & Trost, 2006; Collins & Lanza, 2010) in order to identify subgroups of individuals with profiles of time attitudes (Andretta et al., 2014; Buhl & Linder, 2009; Konowalczyk, Buhl, et al., 2019; Konowalczyk, Clemens, et al., 2019; McKay et al., 2018; Wells, Morgan, et al., 2018). These studies have reported different amounts of time attitude subgroups. For example, Buhl (2014) identified five subgroups with a sample of adolescents in Germany, whereas Buhl and Linder (2009) identified six subgroups in a sample of adolescents in Germany. Thus, in the current study, we sought to contribute to this literature by examining time attitude subgroups among adolescents in the United States and Germany. We included participants from different countries in order to better understand time perspective across cultures and contribute toward research in this area (Sircova et al., 2015).

To the extent that time perspective is considered a universal construct, examining the same questions in two contexts in which scores are invariant – that is, Germany and the US (Worrell et al., 2013) – will facilitate our understanding of how correlates of time perspective differ across national contexts. Further, we investigated how time attitude subgroups were associated with risky behaviors, given that adolescence is a developmental period where individuals are prone to engage in behaviors that are associated with adult well-being, such as school absence (European Commission, 2013). This aim also draws from the work showing that time perspective is modifiable and may be a fruitful intervention target for promoting adolescents health (Hall & Fong, 2003).

## Time Perspective

Time perspective has been theorized to be a cognitive-motivational construct that underlies human behavior (Cottle, 1967; Mello, 2019; Mello & Worrell, 2015; Stolarski et al., 2015; Zimbardo & Boyd, 1999). Theoretically, scholars have argued that time perspective is a foundational construct that contributes to various adaptive and maladaptive behaviors (Cottle, 1967; Mello & Worrell, 2015; Stolarski et al., 2015; Zimbardo & Boyd, 1999). In other words, these scholars have argued that time perspective causes human behaviors and feeling. However, the specific mechanism linking time perspective to human behaviors and feelings has yet to be determined, although Zimbardo and Boyd (1999) have ar-

gued that it is decision making that connects one's time perspective to their actions. Early on, Lewin (1951, pp. 207-208) posited the following:

Time perspective...includes the psychological past and psychological future.... time perspective existing at a given time has been shown to be very important for many problems such as the level of aspiration, the mood, the constructiveness, and the initiative of the individual.

Research on time perspective has focused primarily on adults age groups (Carstensen, 2006; Stolarski et al., 2015; Zimbardo & Boyd, 1999), even though early theorizing about the construct suggested that time perspective is evident across the life-span (Frank, 1939; Lewin, 1946, 1951). Recognizing that there was a gap in our understanding of time perspective among young individuals, Mello and Worrell (2015) proposed a conceptual model for time perspective among adolescents particularly. However, research on adolescents remains relatively limited compared to the research that has been conducted with adults.

Conceptual models have partitioned the construct into multiple dimensions including orientations and feelings about the past, present, and future (Cottle, 1967; Mello & Worrell, 2015; Zimbardo & Boyd, 1999). Time attitudes refer to the positive and negative evaluative feelings toward the past, present, and future, and have emerged as a particularly fruitful dimension of time perspective (Andretta et al., 2014; McKay et al., 2021; Prow et al., 2016; Worrell et al., 2013). A meta-analysis has documented the growth in studies examining time attitudes (McKay et al., 2021). For example, positive and negative time attitudes were associated with psychological distress (Loose, 2022) and self-esteem (Donati et al., 2018).

## Time Attitude Profiles

Time attitude profiles refer to subgroups of individuals with similar time attitudes. Profiles are generated from person-oriented methodological strategies that identify subgroups of individuals with similar qualities (Bergman & Trost, 2006; Magnusson & Bergman, 1990; von Eye & Bogat, 2006). Person-oriented strategies (Bergman & Magnusson, 1997; Bergman & Trost, 2006; Collins & Lanza, 2010) are particularly useful for examining time attitudes because the construct includes multiple time periods (past, present, and future) and valences (positive and negative). Researchers have used profile analysis to determine subgroups that have similar responses on the time attitude subscales (Worrell et al., 2013).

Buhl and Linder (2009) reported six time attitude subgroups with a sample of German adolescents. The subgroups included adolescents who had time attitudes that were named Ambivalents, Balanced, Optimists, Past-Pessimists/Future-Optimists, Pessimists, and Tangentially Pessimists. Andretta et al. (2014) identified five time attitude subgroups—Balanced, Negatives, Optimists, Pessimists, and Positives—in a sample of adolescents in the United States. A study with German, Spanish, and Luxembourgian samples of adolescents identified five subgroups, including Ambivalents, Balanced, Optimist, Past Negative, and Positive subgroups (Konowalczyk, Clemens, et al., 2019). More recently, a study with Spanish high school students reported four time attitude profiles including Negatives, Past Negatives, Positives, and Present/Future Negatives (Tejada-Gallardo et al., 2021a). In summary, the extant research suggests that profiles differ across cultures.

Despite differences in the number and type of time attitude profiles identified by researchers, some studies have shown that membership in profiles is stable across time. For

example, researchers examining samples of adolescents in the United Kingdom identified four time attitude subgroups, including Ambivalents, Negatives, Positives, and Moderately-Negatives, and indicated that the number and type of time attitude subgroups remained stable across two years (Wells, McKay, et al., 2018).

## Time Attitude Profiles and Risk Behaviors

Studies have shown how time attitude profiles are associated with risky behaviors among adolescent samples. For example, longitudinal studies have showed associations between time attitude subgroups and alcohol use (Wells, Morgan, et al., 2018). Other studies have demonstrated associations between key indicators of developmental outcomes that may also indicate how time attitudes would be associated with risky behaviors. For example, Tejada-Gallardo et al. (2021a) showed that time attitude subgroups were associated with psychological distress. Time attitude subgroups were also associated with physical self-concept and sports club membership (Konowalczyk, Clemens, et al., 2019). Further, Buhl and Linder (2009) reported that time attitude subgroups were associated with academic aspirations, personality, and life satisfaction.

## The Present Study

We addressed the following two research questions in the current study. First, are time attitude profiles among samples of adolescents in the United States and Germany profiles similar or different from one another? Second, are time attitude profiles associated with risky behaviors among adolescents in the United States and Germany?

## Method

### Participants

*American* participants were 742 adolescents who were on average aged 15.71 ( $SD = 1.53$ ); 53.6 percent were female and they were enrolled in Grades 5 to 12. *German* participants were 610 adolescents who were on average aged 14.75 ( $SD = 1.47$ ); 51.4 percent were female, and they were enrolled in Grades 6 to 10.

### Measures

#### *Time Perspective*

Time perspective was measured with the Adolescent Time Inventory–Time Attitude Scale (AATI-TA) English and German versions (Worrell et al., 2013). *Table 1* shows the subscales, sample items, descriptive statistics, and internal consistency estimates. Cronbach alpha estimates ranged from .77 to .89 for the United States and .75 to .90 in Germany. A recent study (blinded for review) showed that AATI-TA English scores had strong test-

retest reliability estimates and prior studies have provided evidence of concurrent validity (Worrell & Mello, 2009) and structural validity (Worrell et al., 2013).

### *Risky Behaviors*

Five items were used to address risky behaviors. Response options ranged from 1 (*never*) to 5 (*very often*). The scale has been used in prior research with adolescents, including a study that showed risky behaviors predicted high school dropout status (Worrell & Hale, 2001). *Table 2* shows the items and the sample averages reported by adolescents in the United States and Germany. *Figure 1* illustrates the sample averages for each item across the two countries.

## Procedure

Data in the United States were collected in 2006 in a cross-sectional study. Trained researchers announced the study in classrooms and distributed materials to interested adolescents. Adolescents who returned assent and parental consent forms were compensated \$10 and constituted the sample. Procedures were approved by the university affiliated with the first author. Data in *Germany* came from a longitudinal study and were collected in 2014. Procedures were approved by the university affiliated with the second author. Both samples were obtained with convenient sampling procedures.

## Analytic Strategy

Latent profile analysis (LPA) is a person-centered approach and a special form of Latent Class Analysis used for classifying data drawn from interval scales (Bergman & Magnusson, 1997; Bergman & Trost, 2006; Collins & Lanza, 2010). The goal of LPA is to explain inter-individual differences in responses by constructing a number of groups or latent profiles. We used the MPlus (Muthen & Muthen, 2000) statistical program to determine the number and type of subgroups of adolescents with particular time attitude profiles. Adolescents within a subgroup had similar pattern of responses, whereas adolescents belonging to different subgroups had different patterns of responses. Models with increasing numbers of profiles were fit and compared to determine the optimal model. Model selection was based on Bayesian information criterion (BIC, sample size adjusted BIC) and other fit indices (Akaike Information Criterion, Entropy). Model identification was checked with multiple sets of starting values. Missing data were handled using full information maximum likelihood estimation (FIML). Non-standardized scores were used to create the time attitude profiles.

## Results

### Preliminary Analyses

Consistent with prior international research (Worrell et al. 2013), there were differences ( $p < .00$ , Bonferroni corrected) in time attitude scores between U.S. and German adoles-

cents (See *Table 1*). On average, American adolescents agreed less with the positive scales and more strongly with the negative scales. Differences between the U.S. and Germany were also observed for risky-behaviors (See *Figure 1*). American adolescents reported more skipping school without an excuse, damaging school property, getting something by threatening, and hurting someone badly than German adolescents. In contrast, German adolescents reported more hitting a teacher or making a teacher angry than American adolescents ( $p < .00$ , Bonferroni corrected).

## Time Attitude Profiles

We followed the suggestions by Ram and Grimm (2009) to identify time attitude profiles that includes (1) estimation output inspection, (2) model comparison, (3) model classification evaluation, and (4) likelihood ratio tests. *Table 2* provides the indices we used for our decision-making. The AIK (Akaike Information Criterion) and the BIC (Bayesian Information Criterion) did not provide a clear indication of the profile number. Entropy suggested a five-profile solution for the US sample and a six-profile solution for the German sample. The likelihood tests suggested a five-profile solution fit the data best in Germany and a seven-profile solution fit the data best in the US. After considering the indices and prior theory and research in this area (Buhl & Linder, 2009; Mello & Worrell, 2015), we determined that the five-profile solution was best for both the US and Germany samples. *Figure 2* shows the time attitude profiles and *Figure 3* includes the membership frequencies for each country and *Table 3* shows the means and standard deviations for each profile.

The profiles are named based on prior research (Buhl & Linder, 2009) as follows: *Ambivalents* (*Figure 2A*) included 17.2 percent of the adolescents in the United States and 21.3 percent of the adolescents in Germany. This subgroup was characterized by time attitude scores that indicated mostly neutral responses across the past, present, and future. *Balanced* (*Figure 2B*) included 47.7 percent of the adolescents in the United States and 23.6 percent of the adolescents in Germany. This subgroup was characterized by time attitude scores that were generally near the midpoint for all time attitude subscales. *Extremely (Past) Negatives* (*Figure 2C*) included 4.3 percent of the adolescents in the United States and 1.8 percent of the adolescents in Germany. As indicated, these individuals had high past, present, and future negative scores. *Optimists* (*Figure 2D*) included 13.8 percent of the adolescents in the United States and 6.9 percent of the adolescents in Germany. This subgroup was characterized by very high future positive scores. *Positives* (*Figure 2E*) included 14.0 percent of the adolescents in the United States and 46.4 percent of the adolescents in Germany, with very high positive scores and very low negative scores. In the United States, almost half of the adolescents were members of the Balanced profile, whereas in Germany, a similar percentage of adolescents were members of the Positive profile.

## Time Attitude Profiles Associated With Risky Behaviors

Time attitude subgroups were associated with risky behaviors (*Figure 4*). Among adolescents who reported skipping a day at school without an excuse, more were in the Optimists subgroup in the United States and in the Extremely (Past) Negatives subgroup in Germany. Among adolescents who indicated damaging school property, more were in the Ambivalents subgroup in the United States and in the Extremely (Past) Negatives sub-

group in Germany. Among adolescents who got something by threatening, more were in the Ambivalents subgroup in the United States and in the Extremely (Past) Negatives subgroup in Germany. Among adolescents who hit a teacher or made a teacher angry, more were in the Optimists subgroup in the United States and in the Extremely (Past) Negatives subgroup in Germany. Among adolescents who hurt someone badly, more were in the Extremely (Past) Negatives subgroup in the United States and in Germany. Overall, in the United States, adolescents who engaged in risky behaviors were generally in the Ambivalents and Extremely (Past) Negatives subgroups, whereas, in Germany, adolescents in the Extremely (Past) Negatives Profile reported more risky behaviors than their counterparts.

## Discussion

To contribute toward the growing literature on time attitudes (Donati et al., 2018; Finan et al., 2021; Konowalczyk, Clemens, et al., 2019; Loose, 2022; Tejada-Gallardo et al., 2021a), we conducted latent profile analyses with time attitude subscale scores to identify adolescent subgroups in the United States and Germany. Further, we examined associations between adolescent time attitude subgroups and risky behaviors in schools in an effort to provide information about potentially modifiable mechanisms that may reduce risky school behaviors. We identified five time attitude subgroups in both the adolescent samples from the United States and Germany (*Ambivalents*, *Balanced*, *Extremely [Past] Negatives*, *Optimists*, and *Positives*).

Comparing findings from the current study and past research on time attitude subgroups in the United States (Andretta et al., 2014) and Germany (Buhl & Linder, 2009) indicated some common subgroups. Across studies, *Balanced* and *Optimist* subgroups have been observed. However, there are also differences in some of the subgroups that have been found. For example, in our study an *Extremely [Past] Negative* subgroup was identified, a profile that has not been observed in the prior literature. The differences in subgroups may be due to sampling, culture, or historical time. Given that person-oriented analytic approaches are relatively new, it will be important to determine the number and types of subgroups that are reported in the future and in relation to events and traumas, such as the pandemic.

Time attitude subgroups were associated with risky behaviors in both samples from the United States and Germany. Our study extends prior research on associations between time attitudes and other potentially problematic behaviors such as alcohol use (Wells, Morgan, et al., 2018) to school-related risky behaviors. Given the importance of school completion (European Commission, 2013), it is noteworthy that how adolescents' feelings about the past, present, and future were associated with school-related risky behaviors. One explanation of these findings draws from Zimbardo and Boyd's (1999) theorizing about time perspective that posited the mechanism linking time attitude profiles and risky behaviors was decision making. In other words, adolescents with particular time attitude profiles will make decisions that lead them to actions that are risky. Determining the specific mechanism linking time perspective to behaviors remains an important direction of future research.

Our findings indicate relationships in both the samples from the United States and Germany, but there were some differences in the particular subgroups that were associat-

ed with the riskiest behaviors. The findings suggest that there might be cultural differences in how adolescents who engage in risky behavior view time. In other words, depending on the cultural context, time perspective may function differently. Researchers have highlighted the ways in which time perspective is embedded in cultural contexts (Jones, 1988; Jones & Leitner, 2015; Sircova et al., 2015). Thus, it would be especially useful for international collaborations to report on time attitude profiles around the globe.

The results from our study have implications for programs that use time perspective to change behavior. Research indicates that time perspectives may be changed with intervention. When adolescents and young adults were taught how to emphasize the past, present, and future equally, their time perspective changed, and they showed an increase in career planning compared to a control group (Marko & Savickas, 1998). The intervention included activities encouraging participants to consider the past, present, and future. Moreover, time perspective has been targeted to increase physical activity in adults (Hall & Fong, 2003). The program underscored the impact of actions in the present (i.e., exercising) on physical health in the future. Findings showed that participants in the time perspective condition increased their physical activity. Further, Davies and Filippopoulos (2015) demonstrated that time perspectives were changed in an addiction treatment intervention program for adults. Mostly recently, Tejada-Gallardo et al. (2021b) indicated that participation in a positive psychological intervention led to high school students transitioning to positive time attitude subgroups.

Ultimately, the consequences of this line of inquiry could include using time attitude profiles to identify adolescents who are at-risk of engaging in risky behavior. Alternatively, adolescents who have already engaged in risky behavior may be taught to have different time attitude profiles in order to prevent engaging in future risky behaviors. Overall, time perspective research has the potential to inform intervention programs that combat the challenges associated with social inequality, such as low-income status and discrimination based on race/ethnicity.

## Limitations and Future Directions

There are some limitations of the current study and several areas of additional research that would benefit this line of inquiry. First, we used a cross-sectional research design. The most important direction for future studies would be to include longitudinal designs so that the directionality between time perspective and risk-taking may be better understood. Second, our samples were from the general population. Including high-risk adolescents by conducting studies in hospitals, substance use treatment centers, or educational settings for students at-risk of dropping out of school would be beneficial. Third, the risky behaviors were narrow in scope. In the future, it would be helpful to broaden the range of risky behaviors that are assessed. This direction can include mental or physical health domains. Fourth, there were differences in the average age of the samples. The participants from America were 16 years-old and the participants in Germany were 15 years-old. Although both samples were in adolescence, the age differences could have contributed to the findings. Lastly, there is a debate about the ideal statistical technique to determine associations between profiles and outcomes. Thus, it would be useful to employ additional methods, such as the three-step approach.

## Conclusion

We used a person-centered approach to examine associations among time attitude profiles – positive and negative feelings about the past, present, and future – and risky behaviors in samples of adolescents in the U.S. and Germany. Latent profile analyses supported three more adaptive (Positive, Balanced, and Optimists) and two less adaptive (Ambivalent, Extremely Past Negative) time attitude profiles that were replicated across both samples. Time attitude profiles were associated with risky behaviors. Findings support the investigation of time attitudes as a meaningful correlate of risky behaviors in adolescents and across cultures.

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Tables and Figures

Table 1: Descriptive Statistics for Adolescent Time Inventory-Time Attitude Scores

Time attitude		United States		Germany		t-test
Subscale	Sample item	M (SD)	α	M (SD)	α	p-value Bronferroni corrected
Past Positive	"I am content with my past."	3.28 (0.38)	.87	4.11 (0.99)	.90	t(1362)=-19.55 p<.00
Past Negative	"I have unpleasant thoughts about my past."	2.59 (0.48)	.81	1.98 (1.03)	.84	t(1366)=11.66 p<.00
Present Positive	"I am happy with my current life."	3.16 (0.41)	.81	3.97 (0.91)	.90	t(1372)=-20.62 p<.00
Present Negative	"I wish that my present life were different."	2.73 (0.51)	.83	2.08 (0.89)	.75	t(1363)=16.02 p<.00
Future Positive	"Thinking about my future excites me."	2.37 (0.48)	.89	4.03 (0.87)	.89	t(1374)=-17.05 p<.00
Future Negative	"I doubt I will make something of myself."	2.82 (0.44)	.77	1.83 (0.83)	.80	t(1367)=26.57b p<.00

Table 2: Time Attitude Latent Profiles

Model	AIC	BIC	Adjusted BIC	Entropy	Log-likelihood	n	d	aLMR	aLMR p	BLRT	BLRT p
United States											
2	5026.201	5113.906	5053.574	0.720	-2718.268	747	19	438.858	0.00	-2718.268	0.00
3	4889.172	5009.189	4926.629	0.641	-2418.586	747	26	147.838	0.07	-2494.101	0.00
4	4778.355	4930.685	4825.897	0.716	-2356.177	747	33	122.179	0.23	-2418.586	0.00
5	<b>4692.887</b>	<b>4877.529</b>	<b>4750.514</b>	<b>0.722</b>	<b>-2306.443</b>	<b>747</b>	<b>40</b>	<b>97.365</b>	<b>0.31</b>	<b>-2356.177</b>	<b>0.00</b>
6	4627.472	4844.427	4695.184	0.709	-2266.736	747	47	77.736	0.54	-2306.443	0.00
7	4579.214	4828.481	4657.011	0.731	-2235.607	747	54	61.166	0.02	-2266.850	0.00
Germany											
2	8866.809	8951.156	8890.834	0.875	-4214.472	610	19	1309.373	0.00	-4883.741	0.00
3	8618.006	8733.429	8650.883	0.812	-4090.512	610	26	242.517	0.11	-4214.472	0.00
4	8436.681	8583.179	8478.409	0.851	-3989.605	610	33	197.417	0.09	-4090.512	0.00
5	<b>8284.150</b>	<b>8461.724</b>	<b>8334.729</b>	<b>0.867</b>	<b>-3906.619</b>	<b>610</b>	<b>40</b>	<b>162.355</b>	<b>0.05</b>	<b>-3989.605</b>	<b>0.00</b>
6	8154.417	8363.067	8213.848	0.890	-3845.454	610	47	119.664	0.07	-3906.619	0.00
7	7680.484	7918.811	7747.372	0.898	-3786.242	610	54	115.844	0.09	-3845.454	0.00

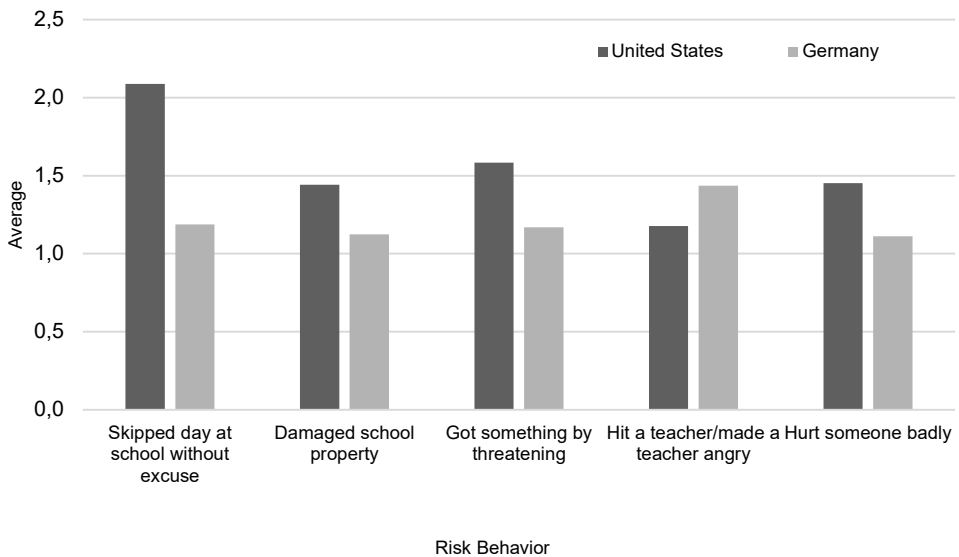
Note: Bolded numbers indicate the best fitting models. AIC = Akaike information criterion. BIC = Bayesian information criterion. aBIC = sample size adjusted BIC. aLMR = adjusted Lo-Mendell-Rubin test. BLRT = Bootstrapped likelihood ratio test. Significant p values for both the LMR and BLRT indicate that the k-1-class model should be rejected in favor of a k-class model.

Table 3: Descriptive Statistics for the Time Attitude Profiles

Profile	Ambivalents		Balanced		Extremely (Past) Negatives		Optimists		Positives	
	US	Ger.	US	Ger.	US	Ger.	US	Ger.	US	Ger.
	<b>17.2%</b>	<b>21.3%</b>	<b>47.7%</b>	<b>23.6%</b>	<b>4.3%</b>	<b>1.8%</b>	<b>13.8%</b>	<b>6.9%</b>	<b>17.0%</b>	<b>46.4%</b>
Past Positive	3.21 (0.63)	3.07 (0.80)	3.66 (0.54)	4.40 (0.60)	2.00 (0.55)	1.93 (0.80)	2.59 (0.68)	2.85 (0.83)	4.36 (0.53)	4.70 (0.46)
Past Negative	2.93 (0.60)	3.06 (0.78)	2.18 (0.50)	1.70 (0.60)	4.26 (0.42)	4.45 (0.55)	3.49 (0.50)	3.34 (0.79)	1.56 (0.49)	1.34 (0.48)
Present Positive	2.96 (0.56)	3.00 (0.73)	3.69 (0.44)	3.65 (0.56)	2.52 (0.67)	1.71 (0.64)	3.38 (0.59)	4.06 (0.65)	4.36 (0.42)	4.65 (0.40)
Present Negative	3.07 (0.60)	3.09 (0.68)	2.06 (0.44)	2.37 (0.58)	3.42 (0.75)	3.75 (0.54)	2.53 (0.62)	1.84 (0.69)	1.39 (0.36)	1.44 (0.47)
Future Positive	3.24 (0.64)	3.36 (0.81)	3.87 (0.59)	3.64 (0.64)	2.93 (0.69)	1.76 (0.72)	4.34 (0.57)	4.55 (0.53)	4.56 (0.48)	4.56 (0.51)
Future Negative	2.45 (0.58)	2.68 (0.68)	1.73 (0.44)	2.07 (0.61)	2.91 (0.75)	4.30 (0.53)	1.44 (0.39)	1.46 (0.45)	1.19 (0.28)	1.29 (0.41)

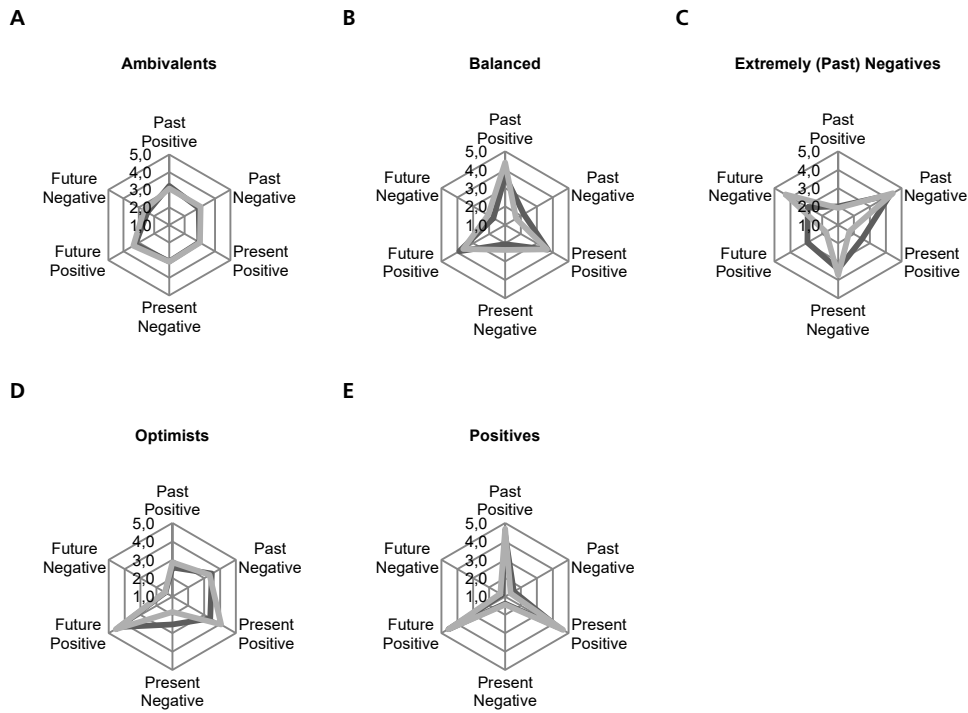
Note: Mean and (SD) shown. Ger. = Germany.

Figure 1: Risk Behavior Averages for Adolescents in the United States and Germany



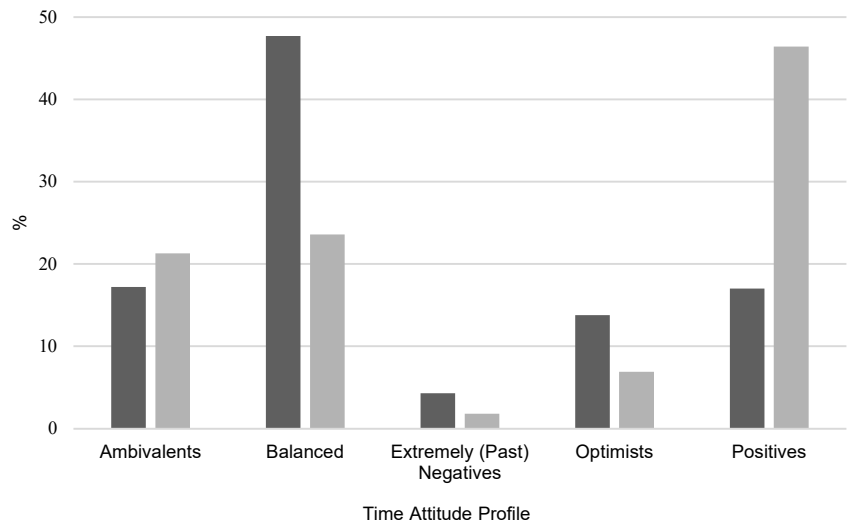
Note: Differences were tested with t-tests and p-values were corrected with Bonferroni. Skipped day at a school without excuse:  $t(1370) = 17.66, p < .00, US > Germany$ ; Damaged school property:  $t(1372) = 8.26, p < .00, US > Germany$ ; Got something by threatening:  $t(1371) = 9.65, p < .00, US > Germany$ ; Hit a teacher/made a teacher angry:  $t(1372) = -5.87, p < .00, US < Germany$ ; Hurt someone badly:  $t(1378) = 8.70, p < .00, US > Germany$ .

Figure 2: Time Attitude Profiles for Adolescents in the United States and Germany



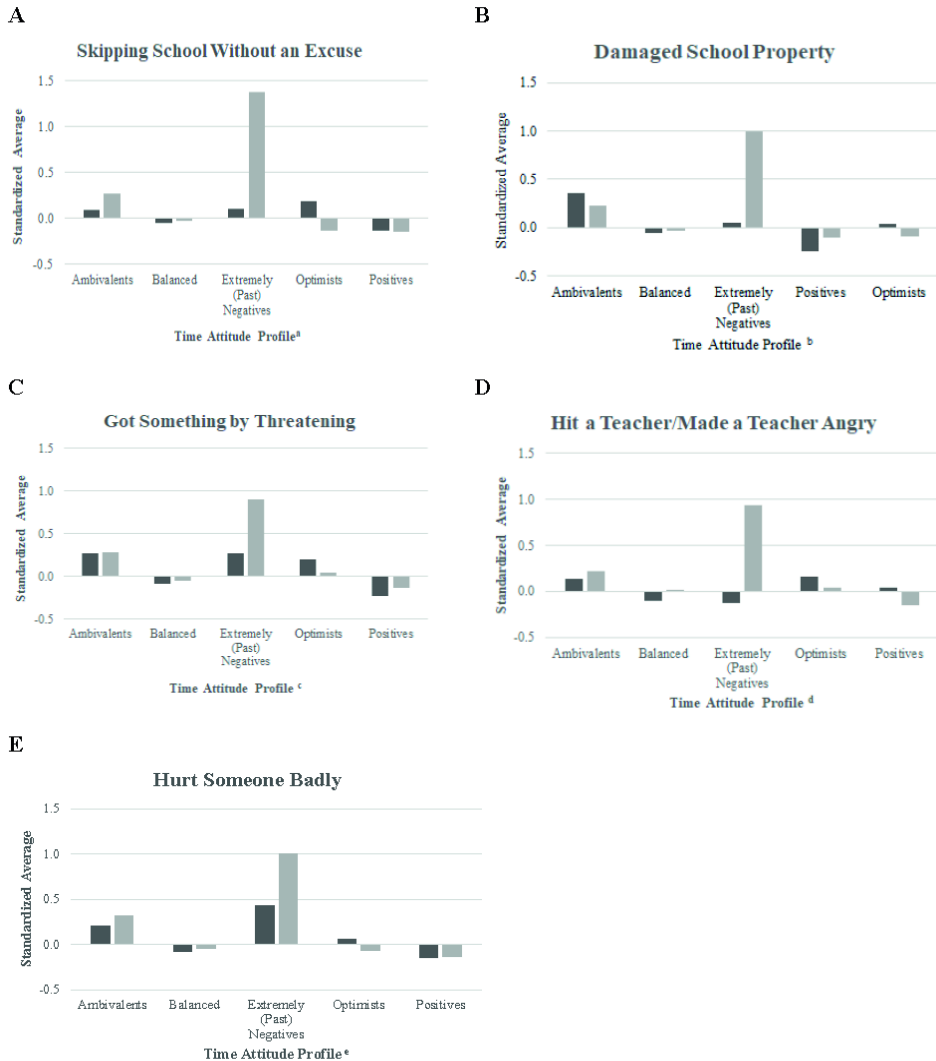
Note: Dark lines correspond to United States, and light lines correspond to Germany

Figure 3: Distribution of Time Attitude Profiles Among Adolescents in the United States and Germany



Note: Dark bars correspond to United States, and light bars correspond to Germany.

**Figure 4:** Associations Between Time Attitude Profiles and Risk Behavior Among Adolescents in the United States and Germany



*Note:* Dark bars correspond to United States, and light bars correspond to Germany. One way, post-hoc Scheffé with z-standardized values conduct and p-values corrected with Bonferroni.

<sup>a</sup> United States: No significant comparisons. Germany: Positives, Balanced, Ambivalents, Optimists < Extremely (past) negatives. US:  $F(4,740) = 2.035, p < .05$ ; Germany:  $F(4,598) = 9.783, p < .00$

<sup>b</sup> United States: Positives < Ambivalents. Germany: Positives, Balanced, Ambivalents, Optimists < Extremely (past) negatives. US:  $F(4,739) = 6.378, p < .00$ ; Germany:  $F(4,599) = 5.271, p < .00$ .

<sup>c</sup> United States: Positives < Ambivalents, Optimists, Extremely (Past) Negatives. Germany: Positives, Balanced, Optimists < Extremely (past) negatives. US:  $F(4,737) = 6.466, p < .00$ ; Germany:  $F(4,600) = 6.075, p < .00$ .

<sup>d</sup> United States: No significant comparisons. Germany: Positives, Balanced, Ambivalents, Optimists < Extremely (past) negatives. US:  $F(4,741) = 2.239, p < .05$ ; Germany:  $F(4,598) = 5.394, p < .00$ .

<sup>e</sup> United States: Positives, Balanced < Extremely (Past) Negatives. Germany: Positives, Balanced, Ambivalents, Optimists < Extremely (past) negatives. US:  $F(4,742) = 4.201, p < .00$ ; Germany:  $F(4,601) = 7.121, p < .00$ .