**Online Appendix B: CPTED Student Survey Scales, Items, Variable Construction, and Analytic Approaches**

**General Outcomes:**

The CPTED Student Survey instrument includes measures of perceived school safety and indicators of violence. The outcomes of interest for this analysis were Student Perceived Safety, Student Perceived Risk of Inappropriate or Violent Behavior (Perceived Risk), Missing school out of concern for safety, Bullying, Victim of verbal and physical abuse, and Perpetration of verbal and physical abuse. Students who answered at least two thirds of the questions for each of constructs were given a value for that construct. Students missing any modeled variable (outcome or exposure in crude models, and/or any covariate in adjusted models) were excluded via listwise deletion. For students answering at least two thirds of questions, an average of non-missing questions was calculated on its original scale (1 to 5). Then this average was typically dichotomized into either “Never” versus “Ever” or “Safe” versus “Not Safe” depending on the type of response given (as detailed below). For example, a student answering 6 of the 7 bullying questions must have said “Never” to all 6 answered questions in order to have an average of 1 for the dichotomized category “never”. Answering any question between 2 for “Seldom (1-2 Days)” and 5 for “Frequently (16+ Days)” would yield an average greater than 1, which would then be dichotomized as “Ever”. One exception is Student Perceived Risk for which a median split of “Never or rarely” versus “More than rarely” was employed. Additional details for each construct are provided below.

*Student Perceived Safety*

Students were asked “Thinking about your life at school over the past month, how safe did you feel in each of these places?” The following 13 specific locations were assessed:

* School parking lots
* School grounds (sidewalks, gathering areas such as outside courtyards and bike rack areas, or any other outdoor area within school boundaries)
* Student entries and exits
* Corridors/hallways and locker areas
* Stairs, stair areas and balconies
* Restrooms
* Classrooms
* Gym locker rooms
* Inside recreation and/or athletic areas such as gyms or practice areas
* Outside recreation and/or athletic areas such as playing fields or courts
* Cafeteria and vending areas
* Portables and other non-attached buildings
* School bus waiting areas

Response options were “Not At All Safe”, “Not Really Safe”, “Sort of Safe”, “Safe”, and “Very Safe”, scaled from 1 to 5. Students who answered at least 9 of the 13 questions were dichotomized into “Safe” versus “Not Safe” based on an average response of at least “Safe” (i.e. an average scaled value of 4 for “Safe”). There were 131 (2.8%) students who did not answer at least 9 questions who were removed from analyses, leaving N=4,586 students in crude analyses and N=4,134 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.95.

*Student Perceived Risk* *of Inappropriate or Violent Behavior*

Students were asked four sets of questions: “Thinking about the past month, how often do you think students have been THREATENED in each of these places?”; “Thinking about the past month, how often do you think students have been in PHYSICAL FIGHTS in each of these places?”; “Thinking about the past month, how often do you think students have USED TOBACCO, ALCOHOL or DRUGS in each of these places?”; and “Thinking about your life at school over the past month, how often did you AVOID each of these places because you felt unsafe?” The following 13 specific locations were assessed:

* School parking lots
* School grounds (sidewalks, gathering areas such as outside courtyards and bike rack areas, or any other outdoor area within school boundaries)
* Student entries and exits
* Corridors/hallways and locker areas
* Stairs, stair areas and balconies
* Restrooms
* Classrooms
* Gym locker rooms
* Inside recreation and/or athletic areas such as gyms or practice areas
* Outside recreation and/or athletic areas such as playing fields or courts
* Cafeteria and vending areas
* Portables and other non-attached buildings
* School bus waiting areas

Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)” or “Frequently (16+ Days)”, scaled from 1 to 5. Only 11% of students answered all “Never” while 86% of students averaged no greater than “Seldom (1-2 Days)”, resulting in a poor split for either of these natural cut-points. To remedy this, a median split was employed, based on equal numbers of students averaging below 1.28 versus students at or above 1.28 on the scale from 1 (“Never”) to 5 (“Frequently (16+ Days)”). As such, students who answered at least 39 of the 52 questions were dichotomized into “Never or rarely” versus “More than rarely” based on this median split. There were 207 (4.4%) students who did not answer at least 39 questions and were removed from analyses, leaving N=4,510 students in crude analyses and N=4,076 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.97.

*Location-specific perceived safety and risk:*

When calculating location-specific scores on perceived safety and perceived risk, portables and stairs were not used because they were not assessed separately in the CSA. Sex specific scores for locker rooms were calculated for male and female students so that associations with CSA scores for male and female locker rooms could be examined. As such this yielded 12 location- specific outcomes for student perceived safety and another 12 location- specific outcomes for student perceived risk, as shown in Table 5.

For the 12 location-specific outcomes pertaining to student perceived safety, the singular question specific to each location “Thinking about your life at school over the past month, how safe did you feel in each of these places?” was dichotomized into “Safe” or “Very Safe” versus “Not At All Safe”, “Not Really Safe” or “Sort of Safe”. There was a range of between 127 (2.7%) and 198 (4.2%) students who did not answer the question specific to a given location who were removed from analyses, leaving between N=4,590 and N=4,519 students in crude analyses and between N=4,138 and N=4,078 students in adjusted analysis (also removing students missing covariates).

For the 12 location-specific outcomes pertaining to student perceived risk, students were asked four questions specific to each location: “Thinking about the past month, how often do you think students have been THREATENED in each of these places?”; “Thinking about the past month, how often do you think students have been in PHYSICAL FIGHTS in each of these places?”; “Thinking about the past month, how often do you think students have USED TOBACCO, ALCOHOL or DRUGS in each of these places?”; and “Thinking about your life at school over the past month, how often did you AVOID each of these places because you felt unsafe?” Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)”, or “Frequently (16+ Days)”. Students who answered at least 3 of the 4 questions with a valid frequency were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There was a range of between 193 (4.1%) and 243 (5.2%) students who did not answer at least 3 of the 4 questions specific to a given location who were removed from analyses, leaving between N=4,524 and N=4,474 students in crude analyses and between N=4,089 and N=4,041 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for these 12 scales ranged from 0.63 (corridors) to 0.71 (locker rooms).

*Missing school out of concern for safety*

Students were asked the following two questions to assess missing school because of safety concerns: “In the last month, how many whole days have you not gone to school WITH parents’ permission…because I felt I would be unsafe at school”, and “In the last month, how many whole days of school have you skipped or cut WITHOUT parents’ permission…because I felt I would be unsafe at school”. Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)” or “Frequently (16+ Days)”. Students were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to either question). There were 557 (11.8%) students who did not answer both questions who were removed from analyses, leaving N=4,160 students in crude analyses and N=3,759 students in adjusted analysis (also removing students missing covariates). The Pearson correlation between these two items was 0.526.

*Bullying*

The bullying questions were introduced with the following text: “Bullying is when one or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when two students of about the same strength or power argue or fight or tease each other in a friendly way. Thinking about your life at school over the past month, how often has any student bullied you by…?” This introduction was followed by 7 statements: “Making fun of you, calling you names, or insulting you?”, “Spreading rumors about you?”, “Threatening you with harm?”, “Pushing you, shoving you, tripping you, or spitting on you?”, “Trying to make you do things you did not want to do, for example, give them money or other things?”, “Excluding you from activities on purpose?”, and “Destroying your property on purpose?”. Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)” or “Frequently (16+ Days)”. Students who answered at least 5 of the 7 questions were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There were 94 (2.0%) students who did not answer at least 5 questions who were removed from analyses, leaving N=4,623 students in crude analyses and N=4,162 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.87.

*Victim of verbal abuse*

Students were asked “During the past month, how many times did the following things happen to you on school property?” followed by 6 statements for verbal abuse: “I was teased.”, “I was pressured to fight someone.”, “I was called bad names.”, “Someone threatened to hurt or hit me.”, “Someone picked an argument with me.”, and “I was threatened with a weapon.” Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)”, “Frequently (16+ Days)”, or “Prefer Not To Answer”, scaled from 1 to 5 for the first 5 valid frequencies and missing for “Prefer Not To Answer”. Students who answered at least 4 of the 6 questions with a valid frequency were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There were 327 (6.9%) students who did not answer at least 4 questions who were removed from analyses, leaving N=4,390 students in crude analyses and N=3,953 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.86.

*Victim of physical abuse*

Students were asked “During the past month, how many times did the following things happen to you on school property?” followed by 4 statements for physical abuse: “I was pushed or shoved.”, “I was physically attacked but not injured.”, “I was slapped or kicked.”, and “I was attacked and injured enough to see a doctor or nurse.” Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)”, “Frequently (16+ Days)”, or “Prefer Not To Answer”, scaled from 1 to 5 for the first 5 valid frequencies and missing for “Prefer Not To Answer”. Students who answered at least 3 of the 4 questions with a valid frequency were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There were 327 (6.9%) students who did not answer at least 3 questions who were removed from analyses, leaving N=4,390 students in crude analyses and N=3,957 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.81.

*Perpetration of verbal abuse*

Students were asked “During the past month, how many times did you do the following things on school property?” followed by 6 statements for verbal abuse: “I teased students.”, “I encouraged other students to fight.”, “I called other students bad names.”, “I threatened to hurt or hit someone.”, “I started an argument.”, and “I threatened someone with a weapon.” Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)”, “Frequently (16+ Days)”, or “Prefer Not To Answer”, scaled from 1 to 5 for the first 5 valid frequencies and missing for “Prefer Not To Answer”. Students who answered at least 4 of the 6 questions with a valid frequency were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There were 318 (6.7%) students who did not answer at least 4 questions who were removed from analyses, leaving N=4,399 students in crude analyses and N=3,968 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.82.

*Perpetration of physical abuse*

Students were asked “During the past month, how many times did you do the following things on school property?” followed by 4 statements for physical abuse: “I pushed or shoved other students.”, “I physically attacked someone but did not injure them.”, “I slapped or kicked someone.”, and “I physically attacked someone and injured them enough to see a doctor or nurse.” Response options were “Never”, “Seldom (1-2 Days)”, “Sometimes (3-5 Days)”, “Often (6-15 Days)”, “Frequently (16+ Days)”, or “Prefer Not To Answer”, scaled from 1 to 5 for the first 5 valid frequencies and missing for “Prefer Not To Answer”. Students who answered at least 3 of the 4 questions with a valid frequency were dichotomized into “Never” versus “Ever” (indicating “Seldom (1-2 Days)” or more to any question). There were 305 (6.5%) students who did not answer at least 3 questions who were removed from analyses, leaving N=4,412 students in crude analyses and N=3,982 students in adjusted analysis (also removing students missing covariates). The Cronbach’s alpha for this scale was 0.80.

**Demographic characteristics modeled as covariates:**

In addition to the primary outcomes of the analysis, the student survey asked for demographic information used as covariates in the adjusted analysis: grade level (6th, 7th, and 8th), biological sex (female and male), race/ethnicity (Hispanic, Non-Hispanic (NH) White, NH Black, NH Asian/Pacific Islander, NH American Indian/Alaska Native, NH Other, and NH missing race), and free/reduced lunch eligibility (free, reduced, neither, and missing). Free/reduced lunch eligibility was collapsed into “Free or reduced lunch eligible” versus “Not eligible”. There were 11 (0.2%) students who did not answer biological sex, 161 (3.4%) students who did not answer race/ethnicity, and 371 (7.9%) students who did not answer free/reduced lunch eligibility, combining to 482 (10.2%) students missing any covariate who were removed from adjusted analyses.