HHS Public Access
Author manuscript
Anthrozoos. Author manuscript; available in PMC 2025 November 06.

Published in final edited form as:
Anthrozoos. 2024 ; 37(6): 1107–1131. doi:10.1080/08927936.2024.2406097.

Pet Ownership and Family Involvement in Sports and Other Activities

Eli D. Halbreich,
Jason Van Allen
Department of Psychological Sciences, Texas Tech University, TX, United States

Abstract

The impact that companion animals may have on adolescent engagement in sports and other activities is currently unclear. This study included participant data gathered from the Adolescent Brain Cognitive Development (ABCD) Study®, a longitudinal study of brain development and youth health outcomes in the United States (*n* = 8,489). This study aimed to clarify the extent to which companion animal type impacts family involvement in sports and other activities. Additionally, it is framed within the bioecological model of human development, which provides a useful framework for human–animal interaction researchers going forward. This study utilized multiple logistic and linear regressions in answering the research questions posed. The results indicate that, when adjusting for context- and person-level covariates, there does not appear to be a meaningful relationship between companion animal type and family involvement in sports and other activities, physical activity, or screen time. This study serves as a guidepost for human–animal interaction researchers as to the importance of including contextual variables in their studies before making claims regarding the impact of companion animals on youth, especially when details about the companion animal relationship are unavailable.

Keywords

Bioecological model; human–animal interaction; physical activity; sports

---

Adolescence is a period of rapid physical and emotional change in the lives of youth (Sawyer et al., 2012). These changes are influenced by both individual and environmental differences (Hollenstein & Lougheed, 2013). It is important to investigate potential protective factors in the lives of adolescents as well as aspects of their development that may be associated with more adaptive mental and physical health outcomes. One potentially important factor for youth is pet ownership; however, there is currently no overarching theory to account for the impact of interactions between families and their pets. Nonetheless, recent research by Barcelos et al. (2023) synthesized previous theoretical frameworks into a series of hypotheses that attempt to account for the impact of pets on wellbeing. A

Address for correspondence: Eli D. Halbreich, Texas Tech University, Department of Psychological Sciences, Box 42051 Lubbock, TX 79409-2051, USA. Eli.Halbreich@ttu.edu.

Disclosure Statement
The authors state there are no conflicts of interest.

goal of the present study was to build upon Barcelos and colleagues' research to integrate their frameworks within the bioecological model of human development (Bronfenbrenner & Morris, 2006). To do that, we utilized data from the Adolescent Brain Cognitive Development (ABCD) Study®, a nationally representative longitudinal study of brain development and youth health outcomes in the United States with a demographically diverse sample of adolescents and their families. In doing so, this work may lay the foundation for future research to build upon when investigating the potential impact of companion animals on the youth with whom they live and how pet ownership relates to family involvement in sports and other activities.

Relevant Theory

Although some researchers in the human–animal interaction (HAI) field have posited theoretical models that could account for variation in outcomes related to HAI (e.g., Beetz et al., 2012; Gee et al., 2021), there is both currently and historically a neglect of sound theoretical bases and methodologies in HAI research (Rodriguez et al., 2021). This study offers a theoretical conceptualization for the hypothesized findings; namely, the bioecological model of human development (Bronfenbrenner & Morris, 2006). The bioecological model allows for considerable flexibility in allowing researchers to conceptualize mechanisms of development across multiple domains. The theory places individuals and the processes in which they engage regularly within their environmental contexts as well as throughout time (Bronfenbrenner & Morris, 2006). This model is particularly conducive to HAI research as companion animals are considered individuals within the immediate proximity of youth and are therefore often involved in interactions (i.e., processes) between them, which include physical activity. However, the model also allows for wide-ranging and diverse sources of influence on an individual, allowing researchers to investigate these influences at a broad level (as was done in this study) and then at a more granular level (as could be explored in future studies).

Figure 1 shows the conceptual factors that are potential sources of influence on youth behavior and development. This model is currently neglected in the HAI literature, with a literature search revealing only a handful of peer-reviewed studies in which it is mentioned (e.g., Canelo, 2020; Costa et al., 2023; Jegatheesan et al., 2020). Due to the limitations of the dataset, this study will primarily focus on process, person, and context, with time being unavailable given the current state of the data collection. As the ABCD Study® continues to collect data, the research question asked herein can be revisited to investigate temporality (i.e., measure changes/stability over time).

Parent/guardian and youth physical activity (PA), youth participation in sports or other activities, as well as parent/guardian and youth screen time are considered as being within proximal processes of the individual (i.e., interactions that occur regularly throughout development between an individual and their environment; Bronfenbrenner & Morris, 2006). Unfortunately, companion-animal interactions (e.g., play frequency, responsibility, etc.) are not captured by the current ABCD Study® measures, so they cannot be considered as processes in this study. Individual and parent demographic characteristics as well as pet type comprise the person aspect (i.e., individual dispositions, resources, demand characteristics, as well as the individual characteristics of those within the individual's microsystem; Bronfenbrenner & Morris, 2006) of the bioecological model. Social contacts, including pets, parents/guardians, and siblings are the microsystems (i.e., the immediate relationships and activities experienced by an individual; Bronfenbrenner, 1994) measured. The interaction between the microsystems comprises the family mesosystem (i.e., the relationships between two or more microsystems; Bronfenbrenner & Morris, 2006). Residential characteristics are characterized as part of the exosystem (walkability, locale, population density; i.e., multiple settings that indirectly impact processes within the setting of the individual; Bronfenbrenner, 1986). The macrosystem – which envelops all of the other contexts and represents the greater cultural and ideological characteristics that affect the contexts it subsumes (Rosa & Tudge, 2013) – includes sociocultural differences between urban and rural locations, but these differences are not directly captured within the ABCD Study®. Thus, they are not included in the analyses but are considered in the theoretical interpretation.

Companion Animals and Adolescents

Companion animals are considered a unique component of the social support network (i.e., mesosystem) of adolescents (Meehan et al., 2017). As an example of the support that they can offer, Carr & Rockett (2017) found that children in long-term foster care turned to their pets to fulfill attachment functions, and some often reported preferring their companion animals over their foster caregivers. In a study of pre-school-aged children, Wenden et al. (2021) suggested that pet dogs may also play a role in the social-emotional development of youth.

However, there are contextual factors beyond the micro- and mesosystems that impact the relationships between pets and adolescents. For example, there are differences in attitudes toward animals between rural and urban college students (Morrison et al., 2021). Specifically, those who either grew up in or were currently living in rural areas reported lower scores on a scale of attitudes toward animals (Morrison et al., 2021). Furthermore, residents of urban areas reported higher companion animal bonding and attachment scores to their pets compared with residents of rural areas (Poresky & Daniels, 1998; Stevens, 1990). However, one study found that rural adolescents who owned pets reported less loneliness than their non-pet-owning counterparts, that companion animal bonding scores were inversely related to loneliness scores, and that pet attachment was positively related to the number of humans in the social support network (Black, 2012). The differences between rural and urban adolescents as they relate to their relationships with their pets should be explored further, as, to our knowledge, there has not been a comprehensive study examining the specific differences between the groups and their pets.

In terms of how companion animals impact youth PA, a scoping review of the literature by Chase et al. (2022) found that dog ownership is also associated with small increases in PA for youth. Dog ownership specifically is associated with increased activity levels compared with non-dog owners (Mueller, et al., 2021; Westgarth et al., 2019). For a recent review of the literature related to dogs and adult PA, see Potter & Sartore-Baldwin (2019). Furthermore, previous literature shows that households with dogs have higher levels of PA compared with households without dogs (McMinn et al., 2011; Owen et al., 2010).

Alternatively, some studies have found more mixed results. For example, Christian et al. (2022) reported in a sample of Australian preschoolers that dog interactions (as opposed to ownership alone) were associated with increases in parent-reported PA, but not as measured by an accelerometer, which aligns with an earlier study of Australian adolescents that found that dog walking was not associated with an increase in overall PA, walking, or pedometer steps (Christian et al., 2014). One possible explanation for ownership alone being insufficient is the lack of detail regarding the specific relationship between the companion animal and family – Gadomski et al. (2017) found that children who reported higher attachment to their dogs also reported more time spent being active with them (although this study did not measure total PA). Similarly, Engelberg et al. (2016) found no difference in moderate-to-vigorous PA (MVPA) between adolescents without a dog and those with a dog they did not walk, but adolescents who reported walking their dog had significantly higher MVPA.

However, these findings should be contextualized in HAI research due to the homogeneity of samples in many studies (Griffin et al., 2019; Rodriguez et al., 2021). An alternative explanation for these findings could be primarily due to differences in access to public spaces for PA (as noted above), such as public parks, as some research shows that there are differences in pet ownership profiles across different locales and population densities (e.g., Applebaum et al., 2023; Mueller, et al., 2021). The dearth of representative samples in the literature highlights the strength of the present study, which utilized a nationally representative dataset with a demographically diverse sample.

Purpose of this Study

Many questions remain regarding the role of pets in youth and family activity. Families that engage in vigorous sports and activities (e.g., running, horseback riding) might prefer active pets (i.e., dogs, horses) that can be included in those sports and activities. Similarly, families that do not participate in vigorous sports and activities might prefer passive pets (i.e., cats, fish). However, families that own active pets might also participate in fewer vigorous activities due to the time commitments associated with pet care (Westgarth et al., 2017).

The HAI literature is historically marred by a lack of high-quality research, including a focus on small, homogeneous samples (Griffin et al., 2019; Rodriguez et al., 2021). Additionally, many findings become minimized when accounting for demographic covariates (e.g., Hardie et al., 2023), which leads authors to publish findings that may be significant but have very small (i.e., meaningless) effect sizes.

The present study marks an important shift in laying the foundation for future high-quality research in the HAI field. Secondary data from a large, nationally representative sample were used to determine if pet ownership alone (not accounting for the human–animal bond) is associated with PA, engagement in sports, and engagement in screentime in a sample of adolescents and family members. By utilizing data from the ABCD Study®, these data can be revisited in the future to assess changes over time.

Hypotheses

Considering the previous research discussed, the following hypotheses were formed. First, to our knowledge, pet type has not been explored in relation to PA or involvement in sports or other activities, but because dog ownership has been associated with higher PA for adolescents as well as adults (e.g., Chase et al., 2022; Potter & Sartore-Baldwin, 2019), it is hypothesized that active pet type (animals that require more active care, such as dogs and horses) will be associated with higher parent (moderate and vigorous) and youth (active) PA levels but lower involvement in sports and other activities (moderate and vigorous) compared with passive (i.e., cats, fish, small animals, or other pets) and non-pet ownership.

Second, while Gadomski et al. (2017) did not find a relationship between attachment (i.e., the emotional bond between children and their pet dogs) and screen time, it is unclear if there is a relationship between types of pet owned and screen time – Gadomski et al. (2017) only investigated attachment to dogs, not any other pet types or differences between pet-owning and non-pet-owning families. Due to the lack of clarity in the literature, this hypothesis is based on the broad theoretical model used in this research; specifically, it is hypothesized that active pet ownership will be associated with a reduction in screen time for both parents and youth compared with passive and non-pet ownership.

Methods

Ethics Approval

The overall study procedures were approved by each local ethics committee of the relevant institutions per National Institutes of Health (NIH) human subjects research guidelines. These data collection procedures are in accordance with Texas Tech University's Institutional Review Board guidelines and the American Psychological Association's Ethical Principles and Code of Conduct.

Participants and Procedure

This research used data from the ABCD Study®, a longitudinal study of brain development and youth health outcomes in the United States. The ABCD Study® collects annual and/or bi-annual physical, cognitive, social, emotional, environmental, behavioral, and academic assessments of youth over a 10-year period. A baseline cohort of 11,878 youth enrolled at 9–10 years of age along with their parents/guardians are included in the study until they are 19 or 20 years old. Initial participants were recruited to participate in the ABCD Study® between July 2016 and August 2018. Recruitment areas were determined by locations of 21 study sites (catchment areas), which closely matched the sociodemographic composition of the United States population. Within the catchment areas, participants were recruited through school-based probability sampling, where schools within each area were coded based on geographic location and sociodemographic characteristics using data from the National Center for Education Statistics and converted into databases that were used to generate lists for random selection (Garavan et al., 2018). The sample target uses a slight oversampling of racial/ethnic minority youth to attempt to recruit a demographically diverse sample. For more information on recruitment, see https://abcdstudy.org/scientists/ and Garavan et al. (2018).

The data collection procedures are well documented as part of the larger ABCD Study® (https://abcdstudy.org/scientists/protocols/). Due to the COVID-19 pandemic, most of the data for the 3-year follow-up were collected remotely, via video chat, tablet, or telephone. For the 3-year follow-up, ABCD Study® researchers collected data related to physical health, mental health, substance use, neurocognition, culture and environment, mobile technology, and other data sources, as well as biospecimens (for those who were in-person). This study analyzed data from the entire ABCD cohort (n = 11,880) except for 12 participants who withdrew consent to share their data as of the ABCD Annual Curated Release 5.0 (DOI: 10.15154/8873-zj65) as well as the other exclusions noted below.

This study utilized an Open Science Framework (OSF) preregistration, which can be found at the following URL: https://osf.io/aw3qs/?view_only=2c37bbaf2e104dc2a185988994f20d24. See "transparent changes" in the online supplemental materials, which notes any changes from the preregistration.

Measures

The parenthetical variable names succeeding each measure heading are ABCD Study® variable names and can be found within the ABCD Study® Data Dictionary (https://data-dict.abcdstudy.org/).

Pet Ownership (ce_y_pet)—The Pet Ownership survey is a youth-report measure of pet ownership developed by the ABCD Study® team. This research categorized pet ownership as follows: no pets, active pets (dog only, horse only, or dog/horse and any other pet), and passive pets (cat, fish, small animal, or other pet). As such, if a participant had an active pet as well as a passive pet, this research categorized them as an active pet owner. Within the analytic sample, 4,765 (56.1%) had dogs in the household, 2,583 (30.4%) had cats, 2,046 (24.1%) had no pets, 1,374 (16.2%) had other small animals, 921 (10.8%) had fish, 463 (5.5%) had other pets, and 71 (0.8%) had horses. A total of 4,773 (56.2%) participants were in the "active pets" group, 2,046 (24.1%) were in the no-pets group, and 1,670 (19.7%) were in the "passive pets" group.

ABCD International Physical Activity Questionnaire (IPAQ; ph_p_ipaq)—The short form of the International Physical Activity Questionnaire is a parent-report measure of the parent's level of PA (Booth, 2000). Within the analytic sample, this research categorized 4,622 (54.4%) participants as moderate-to-vigorous, 1,960 (23.1%) as inactive, 1,528 (18.0%) as light, and 379 (4.5%) as could-not-categorize due to missingness.

ABCD Youth Risk Behavior Survey Exercise Physical Activity (YRB; ph_y_yrb)—The YRB is a youth-report measure of PA and exercise. Within the analytic sample, this research categorized 969 (11.4%) youth as active, 7,507 (88.4%) as inactive, and 13 (0.15%) as could-not-categorize due to missingness.

ABCD Longitudinal Parent Sports and Activities Involvement Questionnaire (SAIQ; ph_p_saiq)—The SAIQ is a parent-report measure of child involvement in sports and other activities. Within the analytic sample, this research categorized 7,118 (83.8%) as moderate-to-vigorous, 252 (3.0%) as light, 697 (8.2%) as none, and 422 (5.0%) as could-not-categorize due to missingness. See Table 1 for a count of participation in each sport and activity. See online supplemental Table S1 for descriptive statistics.

ABCD Parent Screentime Questionnaire (PSQ; nt_p_psq)—The PSQ is a parent self-report of screen time behaviors and behavior modeling. Parents reported an average 400.55 minutes ($SD = 382.47$) of screen time per week, with a median of 307, a minimum of 1, and a maximum of 5,617.

Youth Screen Time (STQ; nt_y_st)—The STQ is a youth self-report measure which includes customized questions about the overall amount of time that the person spends using visual media on a typical weekday and weekend day. Youth reported an average 416.35 minutes ($SD = 499.18$) of screen time per week, with a median of 277, a minimum of 1, and a maximum of 6,907.

Demographic Covariates (abcd_p_demo; gish_p_gi; gish_y_gi)—Parents reported demographic variables about them and their child. The demographic information sought included race, ethnicity, gender (youth self-reported), family structure, income, education, and occupation. ABCD collection site ID was also collected and reported.

Residential History Derived Scores (RHDS; led_l_denspop; led_l_urban; led_l_coi)—The RHDS is a linked external data set which contains information about the physical and natural environment of participants based on parent-reported address. This study investigated variables of walkability, locale (i.e., urbanized areas, urban clusters, rural), public parks, and population density, which were conceptualized as potential covariates in relation to the primary variables of interest. Table 1 contains descriptive information related to the demographic breakdown of the analytic sample.

Data Analysis

Data analyses were conducted in R version 4.2.3 (R Core Team, 2023) using the RStudio (version 2023.6.0.421) integrated development environment (Posit Team, 2023).

Missing Data—This study examined the variables of interest prior to analyses in order to determine the best course of action related to the handling of missing data. We conducted Little's Missing Completely At Random (MCAR) Test, which found that there were 118 distinct patterns of missingness in the data, which – in conjunction with visual inspection – suggested that the data were missing at random (MAR). We examined the proportions of data missing from each analysis variable to determine if the data within a particular measure were likely to be not missing at random (NMAR), but most of the variables had less than 10% missing data and only one (income) had above 10% missing data; variable-level counts are included in online supplemental Table S2. However, Madley-Dowd et al. (2019) suggested that examining the proportion of missingness alone should not be used to guide decision-making regarding missingness; therefore, out of an abundance of caution, we utilized multiple imputation (MI) – as recommended for logistic regression by Peng & Zhu (2008) – and compared coefficients for each analysis (i.e., comparing models with pooled MI datasets vs. datasets with missing values omitted). Importantly, given the relatively low rates of missingness compared with the full sample size, we estimated that omitting participants with missing values would not have a significant impact on power. Thus, case deletions of participants with missing data did likely not affect estimation of population parameters. To ensure that participants' missing data did not systematically differ from those not missing data, we conducted descriptive analyses and constructed comparison plots; results of these tests as well as plots can be found in online supplemental Tables S3 & S4 and supplemental Figures S1–S21, respectively. Although multiple models are presented for comparative purposes, interpretation of the results has been limited to the models with missing values omitted.

Analytic Sample—Following guidance by Saragosa-Harris et al. (2022) regarding the handling of outliers, this study only removed outliers that were obvious errors. It was clear that siblings and twins were oversampled in study recruitment, so to avoid violating the assumption of independence of observations, this study only retained the initially enrolled participants in the analytic sample (i.e., any siblings of participants who participated in the study were removed from data analyses). These considerations reduced the total analytic sample from 10,321 to 8,489. Figure 2 contains an overview of exclusions and analytic sample size per analysis.

Analytic Approaches—Multinomial logistic regression was used to examine pet ownership (active, passive, no pet) and outcome variables related to parent PA levels (inactive, light, moderate-to-vigorous; n = 6,481) as well as youth involvement in sports and other activities (n = 6,448; none, light, moderate-to-vigorous). Binomial logistic regression was used to examine pet ownership (active, passive, no pet) and binary outcome variables related to youth PA levels (n = 6,615; inactive, active). Linear polytomous dummy regression was used to examine the relationship between pet ownership (active, passive, no pet) and changes in screen time for parents (n = 6,617) and youth (n = 6,617). These analyses adjusted for covariates.

For logistic regressions, we conducted Hosmer-Lemeshow (HL) goodness of fit tests to determine model fit; the tests were adjusted to account for power as recommended by Paul et al. (2013). We performed likelihood ratio (LR) tests – wherein the full models were tested against the intercept-only models – to determine if the models were significantly predicting outcomes above 0. Finally, we obtained McFadden's Pseudo R^2, which compares the predictor model against the null model. It is important to note that Pseudo R^2 coefficients do not have standardized guidelines for interpretation and thus should not be used in the same manner as R^2 coefficients in ordinary least squares (OLS) regressions (Hu et al., 2006; Smith & McKenna, 2013). We reported McFadden's Pseudo R^2 as a measure of change in the predictive validity of the full models compared against the models without covariates. For linear regressions, we obtained R^2, which is a measure of the proportion of variance in the outcome variable that is explained by the regression. Interpretation of the value varies, but Ferguson (2009) recommended 0.64 as a strong effect, 0.25 as a moderate effect, and 0.04 as the minimum effect size (with anything less than 0.04 being not practically significant). Adjusted R^2 adjusts for the number of predictors included in a multiple regression model and is interpreted on the same scale as R^2.

Transformations—To better meet the statistical assumptions of logistic and linear regression (see the online supplemental materials: supplemental Table S5 and supplemental Figures S22–S26), this study made some transformations; specifically, in the logistic regression models, we log transformed parent age and square root transformed population density for the two multinomial models, but not for the binomial model. Additionally, in the linear regression models, we square root transformed the outcome variables to adjust for multivariate normality.

Results

For each regression analysis discussed below, we only interpreted the primary outcomes as we included the contextual covariates in each model in order to adjust the estimates appropriately according to theoretical considerations in previous literature.

Pet Ownership and Parent Physical Activity

The results of the HL test indicated acceptable model fit ($\chi^2_{(672)} = 688.55$, $p = 0.32$), meaning that the full transformed model predicted expected parent PA relatively well. The LR test indicated that the model significantly predicted outcomes above the null (meaning that the full model was able to predict parent PA above 0; $\chi^2_{(94)} = 388.94$, $p < 0.05$). McFadden's Pseudo R^2 was 0.002 for the non-covariate model and 0.231 for the full model, resulting in a Δ McFadden's R^2 of 0.229. Compared with non-pet ownership, active pet ownership was not significantly associated with parents being categorized in the light PA (AOR = 1.167, 95% CI: 0.957, 1.424) or MVPA (AOR = 1.005, 95% CI: 0.858, 1.178) groups compared with those categorized in the inactive group, and passive pet ownership was not significantly associated with parents being categorized in the light PA (AOR = 0.957, 95% CI: 0.755, 1.213) or MVPA (AOR = 0.848, 95% CI: 0.702, 1.024) groups compared with those categorized in the inactive group, adjusted for contextual covariates.

The results of the full transformed model are reported in Table 2, the model without covariates is reported in online supplemental Table S6, and the model with missing values imputed (using multiple imputation with five iterations) is reported in online supplemental Table S7.

Pet Ownership and Youth Involvement in Sports and Other Activities

The results of the HL test indicated acceptable model fit ($\chi^2_{(666)} = 612.98$, $p = 0.93$). The LR test indicated that the model significantly predicted outcomes above the null ($\chi^2_{(94)} = 667.16$, $p < 0.05$). McFadden's Pseudo R^2 was 0.01 for the non-covariate model and 0.34 for the full model, resulting in a Δ McFadden's R^2 of 0.33. Compared with non-pet ownership, active pet ownership was not significantly associated with parent-reported youth involvement in light sports and other activities (AOR = 0.958, 95% CI: 0.635, 1.446) compared with not engaging in any sports and other activities, but it was associated with 1.352 (95% CI: 1.067, 1.715) higher odds of involvement in moderate-to-vigorous sports and other activities compared with not engaging in any sports and other activities. However, according to guidelines by Ferguson (2009), this AOR was beneath the recommended minimum effect size, meaning that the effect may not be practically significant. Compared with non-pet ownership, passive pet ownership was not significantly associated with parent-reported youth involvement in light sports and other activities (AOR = 0.941, 95% CI: 0.581, 1.525) or moderate-to-vigorous sports and other activities (AOR = 0.936, 95% CI: 0.708, 1.238) compared with youth not engaging in any sports and other activities, adjusted for contextual covariates. The results of the full transformed model are reported in Table 3, the model without covariates is reported in online supplemental Table S8, and the model with missing values imputed (using multiple imputation with five iterations) is reported in online supplemental Table S9.

Pet Ownership and Youth Physical Activity Levels

The results of the HL test indicated acceptable model fit ($\chi^2_{(350)} = 380.32$, $p = 0.13$). The LR test indicated that the model significantly predicted outcomes above the null $\chi^2(_{(47)} = 139.78$, $p < 0.05$). McFadden's Pseudo R^2 was 0.001 for the non-covariate model and 0.029 for the full model, resulting in a Δ McFadden's R^2 of 0.028. Compared with non-pet ownership, active pet ownership was not significantly associated with self-reported categorization of youth in the active PA group (AOR = 1.117, 95% CI: 0.914, 1.369) compared with being categorized as inactive, adjusted for contextual covariates. Compared with non-pet ownership, passive pet ownership was not significantly associated with self-reported categorization of youth in the active PA group (AOR = 0.925, 95% CI: 0.721, 1.186) compared with being categorized as inactive, adjusted for contextual covariates. The results of the full transformed model are reported in Table 4, the model without covariates is reported in online supplemental Table S10, and the model with missing values imputed (using multiple imputation with five iterations) is reported in online supplemental Table S11.

Pet Ownership and Parent Screen Time

The overall model was significant ($F_{(47, 6,569)} = 31.73$, $p < 0.001$), which indicated that the full model predicted screen time above the null. Adjusted R^2 was 0.004 for the non-covariate model and 0.179 for the full model (Δ Adjusted $R^2 = 0.175$), with the full model demonstrating a small effect. Compared with non-pet ownership, active pet ownership was significantly associated with a self-reported standardized 0.129 minutes more of screen time per week ($t = 4.753$, $p < 0.001$) for parents, adjusted for contextual covariates. However, this finding – while significant – falls under the recommended threshold for practical significance (Ferguson, 2009). Finally, compared with non-pet ownership, passive pet ownership was not significantly associated with changes in self-reported screen time for parents (Standardized $\beta = 0.066$, $t = 2.025$, $p = 0.043$), adjusted for contextual covariates. The results of the full transformed model are reported in Table 5, the model without covariates is reported in online supplemental Table S12, and the model with missing values imputed (using multiple imputation with five iterations) is reported in online supplemental Table S13. To aid in interpretation of this model after outcome variable transformation, we reported standardized beta coefficients.

Pet Ownership and Youth Screen Time

This study performed a linear polytomous dummy regression to examine the relationship between pet ownership type (active, passive, no pet) and changes in screen time for youth (continuous) while adjusting for covariates. We omitted missing values from the sample prior to analysis, resulting in an analytic sample of $n = 6{,}617$. The overall model was significant ($F_{(47,\ 6{,}569)} = 33.1$, $p < 0.001$). Adjusted R^2 was 0.003 for the non-covariate model and 0.186 for the full model (Δ Adjusted $R^2 = 0.183$), with the full model demonstrating a small effect. Compared with non-pet ownership, active pet ownership was significantly associated with a self-reported standardized 0.120 minutes more of screen time per week ($t = 4.333$, $p < 0.001$) for youth, adjusted for contextual covariates. However, this finding—while significant—fell under the recommended threshold for practical significance (Ferguson, 2009). Finally, compared with non-pet ownership, passive pet ownership was not significantly associated with changes in self-reported screen time for youth (Standardized $\beta = 0.011$, $t = 0.324$, $p = 0.746$), adjusted for contextual covariates. The results of the full transformed model are reported in Table 6, the model without covariates is reported in online supplemental Table S14, and the model with missing values imputed (using multiple imputation with five iterations) is reported in online supplemental Table S15. To aid in interpretation of this model after outcome variable transformation, we reported standardized beta coefficients.

Discussion

When taking a broad view of the full models, there do not appear to be practically meaningful (e.g., small effect sizes) differences between those who own active pets, passive pets, and no pets in the domains of self-reported PA, involvement in sports and other activities, and screen time, even though some findings are statistically significant (Dick et al., 2021; Funder & Ozer, 2019). Online supplemental Table S16 shows the AORs for each logistic regression model for ease of interpretation of the primary variables of interest. Study hypotheses were not supported via the results of the analyses conducted.

Overall, we did not find an association between companion animal type and involvement in sports and other activities when adjusting for context- and person-level characteristics, similar to findings from Christian et al. (2014). Although this study did not find any meaningful associations, it is important to note that it, like any other study, is not conclusive – instead, it is merely intended to add context to the current literature. This study did improve upon homogeneity of samples generally included in HAI research (Griffin et al., 2019; Rodriguez et al., 2021); however, it was still not perfectly representative of the population of the United States (see online supplemental Table S17). Additionally, and demonstrating the utility of framing HAI research within the context of the bioecological theory (Bronfenbrenner & Morris, 2006), one strength of this study is in laying the foundation for future questions related to companion animal type and family involvement in sports and other activities. As details related to some of the contextual variables are lacking, as is discussed in the limitations below, future study designs in this area could specifically explore in more granular detail the impact of each variable. Additionally, as data continue to be collected longitudinally, the impact of age and developmental changes associated with aging can be explored as these relationships may change as youth develop.

Limitations

Although the ABCD Study® allows access to a large pool of adolescent data, some of the measures lack crucial contextual information. Notably, due to limitations of the pet ownership measure, this study was not able to assess the bonds between participants and their pets, which previous research has shown to be a potentially limiting factor in studies of HAI (Jacobson & Chang, 2018; Julius et al., 2012; Melson et al., 1991; Wice et al., 2020). Furthermore, the pet ownership measure does not account for any detail about the pet-owning relationship, including length of ownership, number of pets owned, frequency of interactions, or type of pet (e.g., guard dog, working dog, family dog, etc.), which limits the predictive power of this study.

Additional limitations of this study include a lack of longitudinal pet ownership data, that the data analyzed were collected during the COVID-19 pandemic, that the data are not perfectly representative of the United States population, and that the dataset features a number of nested layers which may be better explained by other methodologies, such as multilevel models, hierarchical linear models, or Bayesian models, as noted by Saragosa-Harris et al. (2022).

Conclusions

The primary implications of this study are related to the consideration of bioecological theory as a basis upon which to generate hypotheses, the inclusion of context- and person-level covariates to adjust outcomes, and the utilization of a more representative sample of participants. This study indicated that, within a large sample of adolescents and their families in the United States, companion animal ownership alone – that is, not accounting for relationship factors such as interaction quality or frequency, attitudes toward pets, or the specific emotional bond between adolescents and their companion animals – does not appear to be associated with meaningful changes in odds of engagement in sports or other activities, PA, or screen time while adjusting for context- and person-level covariates. This study is not intended to be the terminus on research related to companion animals and engagement in sports or other activities, PA, or screen time. Instead, we hope that future research will explore the relationships between these variables while being able to account for relationship factors between companion animals and their owners, as those specific relationship factors may be important in describing what is a very complex and individualized relationship.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

The authors acknowledge Megan K. Mueller and Erin K. King, who provided guidance and support for the first author in conceptualizing this research project. The authors also acknowledge the members of the master’s thesis committee, Nicholas C. Borgogna and Adam T. Schmidt.

Data used in the preparation of this article were obtained from the Adolescent Brain Cognitive Development (ABCD) Study® (https://abcdstudy.org), held in the NIMH Data Archive (NDA). This is a multisite, longitudinal study designed to recruit more than 10,000 children aged 9–10 and follow them over 10 years into early adulthood. The ABCD Study® is supported by the National Institutes of Health and additional federal partners under award numbers U01DA041048, U01DA050989, U01DA051016, U01DA041022, U01DA051018, U01DA051037, U01DA050987, U01DA041174, U01DA041106, U01DA041117, U01DA041028, U01DA041134, U01DA050988, U01DA051039, U01DA041156, U01DA041025, U01DA041120, U01DA051038, U01DA041148, U01DA041093, U01DA041089, U24DA041123, U24DA041147. A full list of supporters is available at https://abcdstudy.org/federal-partners.html. A listing of participating sites and a complete listing of the study investigators can be found at https://abcdstudy.org/consortium_members/. ABCD consortium investigators designed and implemented the study and/or provided data but did not necessarily participate in the analysis or writing of this report. This manuscript reflects the views of the authors and may not reflect the opinions or views of the NIH or ABCD consortium investigators. The ABCD data repository grows and changes over time. The ABCD data used in this report came from 10.15154/8873-zj65. DOIs can be found at https://www.doi.org/10.15154/8873-zj65. Additional support for this work was made possible from NIEHS R01-ES032295 and R01-ES031074.

Funding

The analyses for this study were funded in part by the Human Animal Bond Research Institute (HABRI), grant #HAB19-001. This manuscript reflects the views of the authors and may not reflect the opinions or views of HABRI.

References

Applebaum JW, Peek CW, & Zsembik BA (2023). Examining U.S. pet ownership using the General Social Survey. The Social Science Journal, 60(1), 110–119. 10.1080/03623319.2020.1728507

Barcelos AM, Kargas N, Maltby J, & Mills DS (2023). Potential psychosocial explanations for the impact of pet ownership on human well-being: Evaluating and expanding current hypotheses. Human-Animal Interactions, 2023. 10.1079/hai.2023.0008

Beetz A, Julius H, Turner D, & Kotrschal K (2012). Effects of social support by a dog on stress modulation in male children with insecure attachment. Frontiers in Psychology, 3, 352. 10.3389/fpsyg.2012.00352 [PubMed: 23162482]

Black K (2012). The relationship between companion animals and loneliness among rural adolescents. Journal of Pediatric Nursing, 27(2), 103–112. 10.1016/j.pedn.2010.11.009 [PubMed: 22341188]

Booth M (2000). Assessment of physical activity: An international perspective. Research Quarterly for Exercise and Sport, 71(Suppl 2), 114–120. 10.1080/02701367.2000.11082794 [PubMed: 25680021]

Bronfenbrenner U (1986). Ecology of the family as a context for human development: Research perspectives. Developmental Psychology, 22(6), 723–742. 10.1037/0012-1649.22.6.723

Bronfenbrenner U (1994). Ecological models of human development. In Husen T & Postlethwaite TN (Eds.), International encyclopedia of education (2nd ed., Vol. 3, pp. 1643–1647). Pergamon Press/Elsevier Science.

Bronfenbrenner U, & Morris PA (2006). The bioecological model of human development. In Lerner RM & Damon W (Eds.), Handbook of child psychology (6th ed., Vol. 1, pp. 793–828). John Wiley & Sons.

Canelo E (2020). Perceptions of animal assisted reading and its results reported by involved children, parents and teachers of a Portuguese elementary school. Human-Animal Interaction Bulletin, 2020. 10.1079/hai.2020.0019

Carr S, & Rockett B (2017). Fostering secure attachment: Experiences of animal companions in the foster home. Attachment & Human Development, 19(3), 259–277. 10.1080/14616734.2017.1280517 [PubMed: 28277096]

Chase CJ, Mueller MK, Garvey C, & Potter K (2022). Family dog ownership and youth physical activity levels: A scoping review. Current Sports Medicine Reports, 21(1), 18–27. 10.1249/JSR.0000000000000927 [PubMed: 35018895]

Christian H, Trapp G, Villanueva K, Zubrick SR, Koekemoer R, & Giles-Corti B (2014). Dog walking is associated with more outdoor play and independent mobility for children. Preventive Medicine, 67, 259–263. 10.1016/j.ypmed.2014.08.002 [PubMed: 25117524]

Christian H, Wenden EJ, Ng M, & Maitland C (2022). Association between preschooler movement behaviours, family dog ownership, dog play and dog walking: Findings from the PLAYCE study. Preventive Medicine Reports, 26, 101753. 10.1016/j.pmedr.2022.101753 [PubMed: 35251916]

Costa AG, Nielsen T, Christley R, & Hazel S (2023). Highlighting gaps in puppy research using Bronfenbrenner's bioecological theory of human development. Human-Animal Interactions, 2023. 10.1079/hai.2023.0014

Dick AS, Lopez DA, Watts AL, Heeringa S, Reuter C, Bartsch H, Fan CC, Kennedy DN, Palmer C, Marshall A, Haist F, Hawes S, Nichols TE, Barch DM, Jernigan TL, Garavan H, Grant S, Pariyadath V, Hoffman E, … Thompson WK (2021). Meaningful associations in the adolescent brain cognitive development study. NeuroImage, 239, 118262. 10.1016/j.neuroimage.2021.118262 [PubMed: 34147629]

Engelberg JK, Carlson JA, Conway TL, Cain KL, Saelens BE, Glanz K, Frank LD, & Sallis JF (2016). Dog walking among adolescents: Correlates and contribution to physical activity. Preventive Medicine, 82, 65–72. 10.1016/j.ypmed.2015.11.011 [PubMed: 26601644]

Ferguson CJ (2009). An effect size primer: A guide for clinicians and researchers. Professional Psychology: Research and Practice, 40(5), 532–538. 10.1037/a0015808

Funder DC, & Ozer DJ (2019). Evaluating effect size in psychological research: Sense and nonsense. Advances in Methods and Practices in Psychological Science, 2(2), 156–168. 10.1177/2515245919847202

Gadomski AM, Scribani MB, Krupa N, & Jenkins P (2017). Pet dogs and child physical activity: The role of child–dog attachment. Pediatric Obesity, 12(5), e37–e40. 10.1111/ijpo.12156 [PubMed: 27229185]

Garavan H, Bartsch H, Conway K, Decastro A, Goldstein RZ, Heeringa S, Jernigan T, Potter A, Thompson W, & Zahs D (2018). Recruiting the ABCD sample: Design considerations and procedures. Developmental Cognitive Neuroscience, 32, 16–22. 10.1016/j.dcn.2018.04.004 [PubMed: 29703560]

Gee NR, Rodriguez KE, Fine AH, & Trammell JP (2021). Dogs supporting human health and well-being: A biopsychosocial approach. Frontiers in Veterinary Science, 8, 630465. 10.3389/fvets.2021.630465 [PubMed: 33860004]

Griffin JA, Hurley K, & McCune S (2019). Human–animal interaction research: Progress and possibilities. Frontiers in Psychology, 10, 2803. 10.3389/fpsyg.2019.02803 [PubMed: 31920846]

Hardie S, Mai DL, & Howell TJ (2023). Social support and wellbeing in cat and dog owners, and the moderating influence of pet–owner relationship quality. Anthrozoös, 1–17. 10.1080/08927936.2023.2182029

Hollenstein T, & Lougheed JP (2013). Beyond storm and stress: Typicality, transactions, timing, and temperament to account for adolescent change. American Psychologist, 68(6), 444–454. 10.1037/a0033586 [PubMed: 23915399]

Hu B, Shao J, & Palta M (2006). Pseudo-R^2 in logistic regression model. Statistica Sinica, 16(3), 847–860. https://www.jstor.org/stable/24307577

Jacobson KC, & Chang L (2018). Associations between pet ownership and attitudes toward pets with youth socioemotional outcomes. Frontiers in Psychology, 9, 2304. 10.3389/fpsyg.2018.02304 [PubMed: 30534102]

Jegatheesan B, Enders-Slegers M-J, Ormerod E, & Boyden P (2020). Understanding the link between animal cruelty and family violence: The bioecological systems model. International Journal of Environmental Research and Public Health, 17(9), 3116. 10.3390/ijerph17093116 [PubMed: 32365760]

Julius H, Beetz A, Kotrschal K, Turner D, & Uvnäs-Moberg K (2012). Attachment to pets: An integrative view of human–animal relationships with implications for therapeutic practice. Hogrefe Publishing.

Madley-Dowd P, Hughes R, Tilling K, & Heron J (2019). The proportion of missing data should not be used to guide decisions on multiple imputation. Journal of Clinical Epidemiology, 110, 63–73. 10.1016/j.jclinepi.2019.02.016 [PubMed: 30878639]

McMinn AM, van Sluijs EMF, Nightingale CM, Griffin SJ, Cook DG, Owen CG, Rudnicka AR, & Whincup PH (2011). Family and home correlates of children's physical activity in a multi-ethnic population: The cross-sectional Child Heart and Health Study in England (CHASE). The International Journal of Behavioral Nutrition and Physical Activity, 8(11). 10.1186/1479-5868-8-11

Meehan M, Massavelli B, & Pachana N (2017). Using attachment theory and social support theory to examine and measure pets as sources of social support and attachment figures. Anthrozoös, 30(2), 273–289. 10.1080/08927936.2017.1311050

Melson GF, Peet S, & Sparks C (1991). Children's attachment to their pets: Links to socio-emotional development. Children's Environments Quarterly, 8(2), 55–65. https://www.jstor.org/stable/41514782

Morrison R, Maust-Mohl M, & Charlton K (2021). Friend, foe, or food: What influences students' attitudes toward animals? Anthrozoös, 34(2), 187–200. 10.1080/08927936.2021.1885137

Mueller MK, Anderson EC, King EK, & Urry HL (2021). Null effects of therapy dog interaction on adolescent anxiety during a laboratory-based social evaluative stressor. Anxiety, Stress & Coping, 34(4), 365–380. 10.1080/10615806.2021.1892084 [PubMed: 33650444]

Owen CG, Nightingale CM, Rudnicka AR, Ekelund U, McMinn AM, van Sluijs EMF, Griffin SJ, Cook DG, & Whincup PH (2010). Family dog ownership and levels of physical activity in childhood: Findings from the Child Heart and Health Study in England. American Journal of Public Health, 100(9), 1669–1671. 10.2105/AJPH.2009.188193 [PubMed: 20634441]

Paul P, Pennell ML, & Lemeshow S (2013). Standardizing the power of the Hosmer-Lemeshow goodness of fit test in large data sets. Statistics in Medicine, 32(1), 67–80. 10.1002/sim.5525 [PubMed: 22833304]

Peng C-YJ, & Zhu J (2008). Comparison of two approaches for handling missing covariates in logistic regression. Educational and Psychological Measurement, 68(1), 58–77. 10.1177/0013164407305582

Poresky RH, & Daniels AM (1998). Demographics of pet presence and attachment. Anthrozoös, 11(4), 236–241. 10.2752/089279398787000508

Posit Team. (2023). RStudio: Integrated development environment for R [Manual]. Posit Software, PBC.

Potter K, & Sartore-Baldwin M (2019). Dogs as support and motivation for physical activity. Current Sports Medicine Reports, 18(7), 275–280. 10.1249/JSR.0000000000000611 [PubMed: 31283629]

R Core Team. (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/

Rodriguez KE, Herzog H, & Gee NR (2021). Variability in human–animal interaction research. Frontiers in Veterinary Science, 7, 619600. 10.3389/fvets.2020.619600 [PubMed: 33521092]

Rosa EM, & Tudge J (2013). Urie Bronfenbrenner's theory of human development: Its evolution from ecology to bioecology. Journal of Family Theory & Review, 5(4), 243–258. 10.1111/jftr.12022

Saragosa-Harris NM, Chaku N, MacSweeney N, Guazzelli Williamson V, Scheuplein M, Feola B, Cardenas-Iniguez C, Demir-Lira E, McNeilly EA, Huffman LG, Whitmore L, Michalska KJ, Damme KS, Rakesh D, & Mills KL (2022). A practical guide for researchers and reviewers using the ABCD Study and other large longitudinal datasets. Developmental Cognitive Neuroscience, 55, 101115. 10.1016/j.dcn.2022.101115 [PubMed: 35636343]

Sawyer SM, Afifi RA, Bearinger LH, Blakemore S-J, Dick B, Ezeh AC, & Patton GC (2012). Adolescence: A foundation for future health. The Lancet, 379(9826), 1630–1640. 10.1016/S0140-6736(12)60072-5

Smith TJ, & McKenna CM (2013). A comparison of logistic regression pseudo R^2 indices. Multiple Linear Regression Viewpoints, 39(2), 17–26.

Stevens LT (1990). Attachment to pets among eighth graders. Anthrozoös, 3(3), 177–183. 10.2752/089279390787057522

Wenden EJ, Lester L, Zubrick SR, Ng M, & Christian HE (2021). The relationship between dog ownership, dog play, family dog walking, and pre-schooler social-emotional development: Findings from the PLAYCE observational study. Pediatric Research, 89(4), 1013–1019. 10.1038/s41390-020-1007-2 [PubMed: 32624570]

Westgarth C, Boddy LM, Stratton G, German AJ, Gaskell RM, Coyne KP, Bundred P, McCune S, & Dawson S (2017). The association between dog ownership or dog walking and fitness or weight status in childhood. Pediatric Obesity, 12(6), e51–e56. 10.1111/ijpo.12176 [PubMed: 27793067]

Westgarth C, Christley RM, Jewell C, German AJ, Boddy LM, & Christian HE (2019). Dog owners are more likely to meet physical activity guidelines than people without a dog: An investigation of the association between dog ownership and physical activity levels in a UK community. Scientific Reports, 9(1), 5704. 10.1038/s41598-019-41254-6 [PubMed: 31000795]

Wice M, Goyal N, Forsyth N, Noel K, & Castano E (2020). The relationship between humane interactions with animals, empathy, and prosocial behavior among children. Human-Animal Interaction Bulletin, 8(1), 38–49.

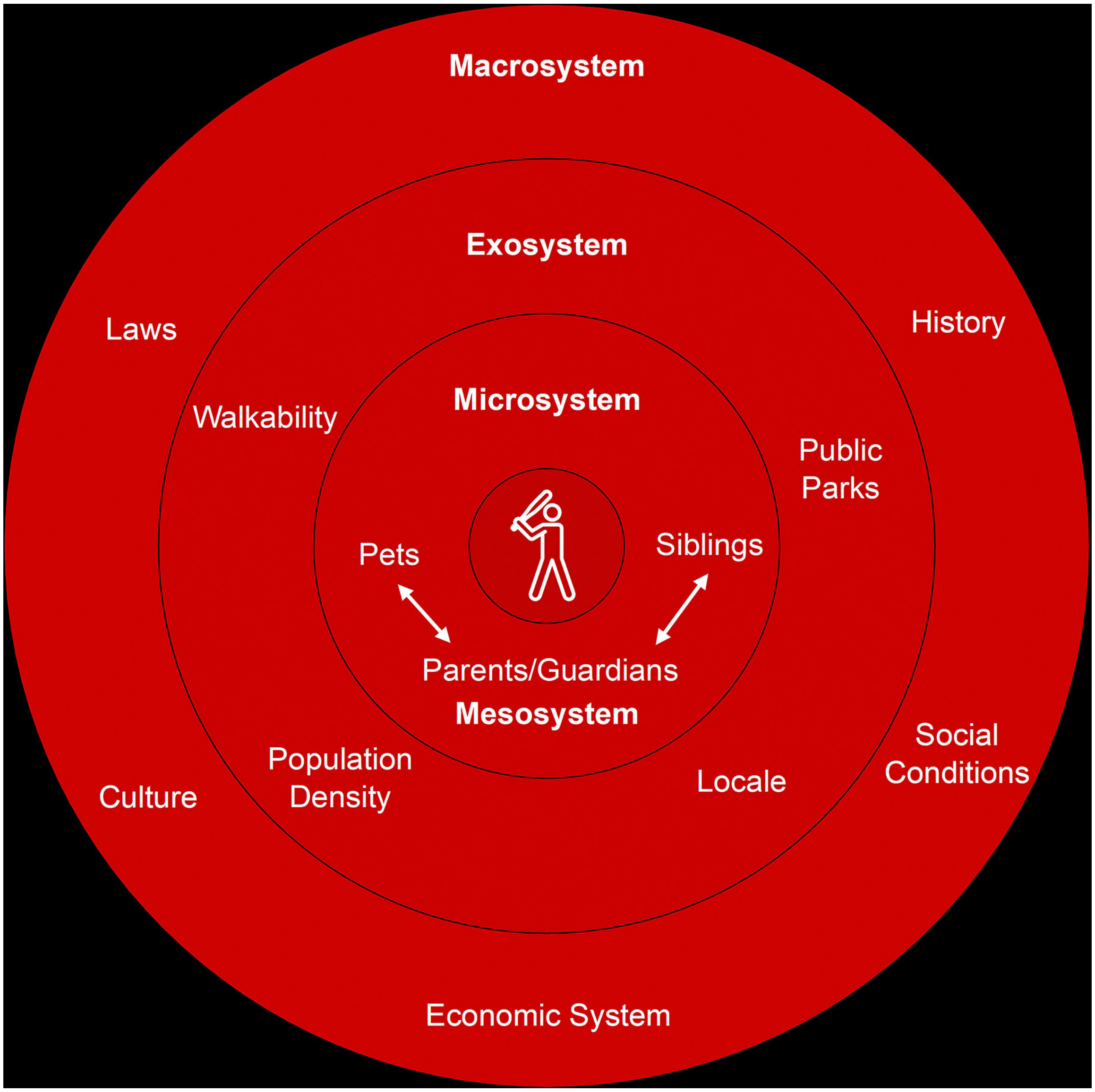

Figure 1.
Theoretical model based on bioecological theory.

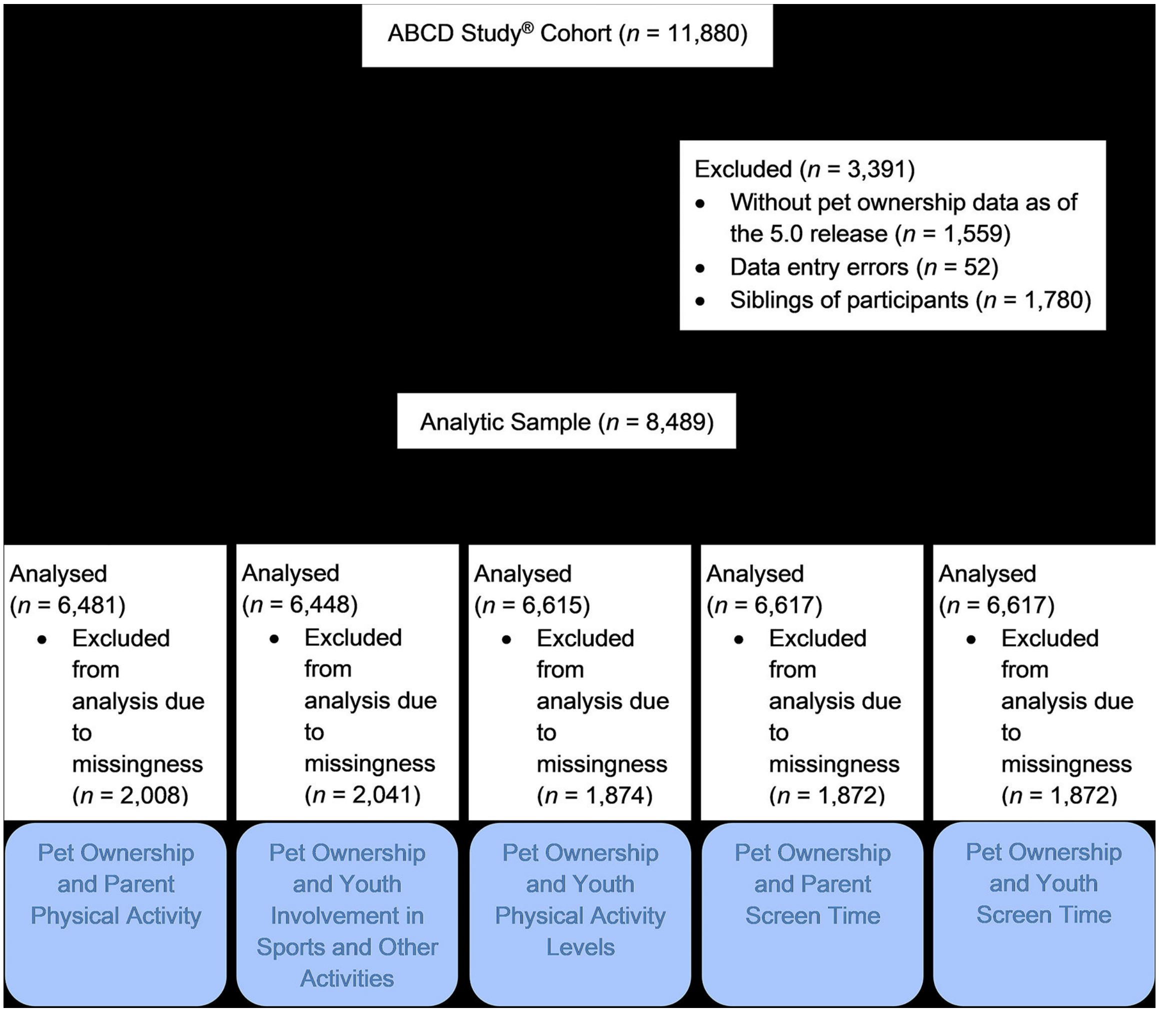

Figure 2.

Flow diagram of analytic sample and exclusions.

Table 1.

Sociodemographic descriptive statistics.

Sociodemographic characteristic	*n (%)*
Parent race[a]	
Asian[b]	306 (3.6)
Black/African American	1,156 (13.6)
Multiracial	420 (5.0)
Native American[c]	44 (0.5)
Other Race, don't know, or refuse to answer	550 (6.5)
Pacific Islander[d]	9 (0.1)
White	5,972 (70.3)
Youth race[e]	
Asian[b]	213 (2.5)
Black/African American	1,178 (13.9)
Multiracial	1,047 (12.3)
Native American[c]	47 (0.6)
Other Race, don't know, or refuse to answer	493 (5.8)
Pacific Islander[d]	7 (0.1)
White	5,496 (64.7)
Parent ethnicity[f]	
Hispanic	1,511 (17.8)
Non-Hispanic	6,929 (81.6)
Youth ethnicity[g]	
Hispanic	1,796 (21.2)
Non-Hispanic	6,588 (77.6)
Parent gender[h]	
Male	873 (10.3)
Female	7,415 (87.3)
Youth gender[i]	
Boy	4,457 (52.5)
Girl	3,704 (43.6)
Locale[j]	
Urbanized area	7,236 (85.2)
Urban cluster	228 (2.7)
Rural	663 (7.8)
Collection Site	
Children's Hospital Los Angeles (CHLA; Site 1)	296 (3.5)
University of Colorado Boulder (CUB; Site 2)	295 (3.5)
Florida International University (FIU; Site 3)	490 (5.8)

Sociodemographic characteristic	***n (%)***
Laureate Institute for Brain Research (LIBR; Site 4)	599 (7.1)
Medical University of South Carolina (MUSC; Site 5)	281 (3.3)
Oregon Health & Science University (OHSU; Site 6)	501 (5.9)
University of Rochester (ROC; Site 7)	191 (2.3)
SRI International (SRI; Site 8)	258 (3.0)
University of California, Los Angeles (UCLA; Site 9)	366 (4.3)
University of California, San Diego (UCSD; Site 10)	584 (6.9)
University of Florida (UFL; Site 11)	292 (3.4)
University of Maryland at Baltimore (UMB; Site 12)	449 (5.3)
University of Michigan (UMICH; Site 13)	557 (6.6)
University of Minnesota (UMN; Site 14)	332 (3.9)
University of Pittsburgh (UPMC; Site 15)	320 (3.8)
University of Utah (UTAH; Site 16)	763 (9.0)
University of Vermont (UVM; Site 17)	442 (5.2)
University of Wisconsin-Milwaukee (UWM; Site 18)	299 (3.5)
Virginia Commonwealth University (VCU; Site 19)	283 (3.3)
Washington University in St. Louis (WUSTL; Site 20)	433 (5.1)
Yale University (YALE; Site 21)	458 (5.4)
	M (*SD*); Median
Parent age[k]	43.2 (6.8); 43
Youth age[l]	12.5 (0.7); 12
Number of children in the household	2.3 (1.4); 2
Household income[m]	7.61 (2.3); 9
Walkability[n]	10.7 (3.8); 10.8
Population density[o]	2,183.5 (2,253.2); 1,717.4
Public parks[p]	0.05 (0.09); 0.02

[a]Participants with missing data (NA) = 32.

[b]Includes the following racial group identities: Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and other Asian.

[c]Includes the following racial group identities: American Indian, Native American, and Alaska Native.

[d]Includes the following racial group identities: Native Hawaiian, Guamanian, Samoan, other Pacific Islander.

[e]NA = 8.

[f]NA = 49.

[g]NA = 105.

[h]NA = 201.

[i]NA = 328.

[j]NA = 362.

[k]NA = 212.

[l]NA = 183.

[m]NA = 884; household income was measured on the following scale: 1 (< $5,000), 2 ($5,000–$11,999), 3 ($12,000–$15,999), 4 ($16,000–$24,999), 5 ($25,000–$34,999), 6 ($35,000–$49,999), 7 ($50,000–$74,999), 8 ($75,000–$99,999), 9 ($100,000–$199,999), and 10 (≥ $200,000).

[n]NA = 647; measured on a scale between 1–20, with 20 being the most walkable.

[o]NA = 343; measured in persons per square kilometer.

[p]NA = 336; proportion of open park land within census tract.

Table 2.

Pet ownership and parent physical activity multinomial logistic regression full model results.

Outcome Group[a]	Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
Light	(Intercept)	0.055	1.293	–2.249	0.025	[0.004, 0.688]
	Pet[b]					
	Active Pets	1.167	0.101	1.524	0.127	[0.957, 1.424]
	Passive Pets	0.957	0.121	–0.364	0.716	[0.755, 1.213]
	Parent race[c]					
	Black/African American	0.551	0.287	–2.071	0.038	[0.314, 0.969]
	Asian	0.957	0.280	–0.155	0.877	[0.553, 1.659]
	Pacific Islander	6.813	1.470	1.305	0.192	[0.382, 121.51]
	Native American	0.468	0.679	–1.120	0.263	[0.124, 1.769]
	Other Race, don’t know, or refuse to answer	0.735	0.300	–1.024	0.306	[0.408, 1.324]
	Multiracial	0.908	0.219	–0.440	0.660	[0.591, 1.396]
	Youth race[c]					
	Black/African American	1.039	0.284	0.134	0.893	[0.595, 1.813]
	Asian	0.952	0.328	–0.150	0.880	[0.5, 1.811]
	Pacific Islander	0.001	0.013	–555.309	0.0	[0.001, 0.001]
	Native American	2.761	0.710	1.431	0.152	[0.687, 11.094]
	Other Race, don’t know, or refuse to answer	1.692	0.306	1.717	0.086	[0.928, 3.084]
	Multiracial	0.965	0.155	–0.230	0.818	[0.712, 1.308]
	Parent Hispanic identity[d]	0.826	0.213	–0.901	0.368	[0.544, 1.252]
	Youth Hispanic identity[d]	0.970	0.183	–0.167	0.867	[0.677, 1.389]
	Parent gender[e]	1.055	0.149	0.359	0.720	[0.788, 1.412]
	Youth gender[f]	1.094	0.078	1.151	0.250	[0.939, 1.276]
	Parent age	1.550	0.275	1.595	0.111	[0.905, 2.655]
	Youth age	1.040	0.058	0.675	0.50	[0.928, 1.166]
	Number of children in the household	0.996	0.030	–0.129	0.897	[0.94, 1.056]
	Income	1.055	0.021	2.597	0.009	[1.013, 1.098]
	Walkability	1.008	0.016	0.486	0.627	[0.977, 1.04]
	Locale[g]					
	Urban cluster	0.950	0.245	–0.208	0.835	[0.588, 1.536]
	Rural	0.715	0.175	–1.923	0.054	[0.508, 1.006]
	Population density	0.999	0.003	–0.306	0.760	[0.994, 1.005]
	Public parks	1.528	0.504	0.841	0.40	[0.569, 4.1]
	Site ID[h]					
	CUB	1.036	0.340	0.105	0.916	[0.532, 2.018]
	FIU	0.985	0.269	–0.057	0.955	[0.581, 1.669]
	LIBR	0.960	0.279	–0.146	0.884	[0.555, 1.66]
	MUSC	1.038	0.329	0.115	0.909	[0.545, 1.98]

Outcome Group[a]	**Variable**	**Adj. *OR***	***SE***	***t***	***p***	**95% CI**
	OHSU	1.197	0.274	0.655	0.512	[0.699, 2.05]
	ROC	0.700	0.351	–1.014	0.311	[0.352, 1.394]
	SRI	1.551	0.320	1.370	0.171	[0.828, 2.907]
	UCLA	1.153	0.287	0.494	0.621	[0.657, 2.023]
	UCSD	1.293	0.254	1.009	0.313	[0.785, 2.127]
	UFL	1.068	0.317	0.208	0.835	[0.574, 1.988]
	UMB	1.234	0.286	0.735	0.463	[0.704, 2.164]
	UMICH	1.161	0.277	0.541	0.589	[0.675, 1.998]
	UMN	1.453	0.301	1.244	0.213	[0.806, 2.619]
	UPMC	1.296	0.310	0.835	0.403	[0.705, 2.382]
	UTAH	0.897	0.267	–0.407	0.684	[0.531, 1.514]
	UVM	1.694	0.317	1.664	0.096	[0.91, 3.151]
	UWM	1.065	0.295	0.212	0.832	[0.597, 1.899]
	VCU	1.148	0.343	0.402	0.688	[0.586, 2.249]
	WUSTL	0.953	0.287	–0.168	0.866	[0.543, 1.671]
	YALE	1.219	0.289	0.683	0.494	[0.691, 2.149]
Moderate-to-Vigorous	(Intercept)	1.098	1.041	0.090	0.929	[0.143, 8.439]
	Pet[b]					
	Active Pets	1.005	0.081	0.066	0.947	[0.858, 1.178]
	Passive Pets	0.848	0.096	–1.716	0.086	[0.702, 1.024]
	Parent race[c]					
	Black/African American	0.588	0.229	–2.320	0.020	[0.375, 0.921]
	Asian	0.481	0.243	–3.010	0.003	[0.299, 0.775]
	Pacific Islander	0.789	1.507	–0.158	0.875	[0.041, 15.129]
	Native American	0.424	0.547	–1.567	0.117	[0.145, 1.24]
	Other Race, don't know, or refuse to answer	0.780	0.242	–1.025	0.306	[0.486, 1.254]
	Multiracial	0.834	0.177	–1.024	0.306	[0.589, 1.18]
	Youth race[c]					
	Black/African American	0.930	0.229	–0.318	0.750	[0.594, 1.456]
	Asian	0.979	0.279	–0.078	0.938	[0.566, 1.691]
	Pacific Islander	1.885	1.394	0.455	0.649	[0.123, 28.984]
	Native American	2.465	0.602	1.500	0.134	[0.758, 8.012]
	Other Race, don't know, or refuse to answer	1.392	0.253	1.309	0.191	[0.848, 2.284]
	Multiracial	0.956	0.125	–0.357	0.721	[0.748, 1.223]
	Parent Hispanic identity[d]	0.872	0.172	–0.798	0.425	[0.622, 1.221]
	Youth Hispanic identity[d]	0.842	0.150	–1.150	0.250	[0.627, 1.129]
	Parent gender[e]	0.588	0.114	–4.649	< 0.001	[0.47, 0.735]
	Youth gender[f]	1.040	0.063	0.618	0.536	[0.919, 1.177]
	Parent age	1.281	0.222	1.117	0.264	[0.83, 1.978]
	Youth age	0.978	0.047	–0.482	0.630	[0.892, 1.072]

Outcome Group[a]	Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
	Number of children in the household	1.002	0.024	0.076	0.939	[0.956, 1.05]
	Income	1.105	0.017	6.003	< 0.001	[1.069, 1.141]
	Walkability	1.020	0.013	1.519	0.129	[0.994, 1.046]
	Locale[g]					
	Urban cluster	0.884	0.202	–0.609	0.542	[0.595, 1.314]
	Rural	0.804	0.137	–1.584	0.113	[0.614, 1.053]
	Population density	0.994	0.002	–2.537	0.011	[0.989, 0.999]
	Public parks	2.813	0.404	2.557	0.011	[1.273, 6.214]
	Site ID[h]					
	CUB	1.796	0.269	2.179	0.029	[1.061, 3.043]
	FIU	1.050	0.218	0.224	0.823	[0.685, 1.608]
	LIBR	0.931	0.227	–0.313	0.754	[0.596, 1.454]
	MUSC	1.154	0.264	0.543	0.587	[0.688, 1.934]
	OHSU	1.083	0.227	0.351	0.726	[0.694, 1.688]
	ROC	0.782	0.273	–0.900	0.368	[0.458, 1.336]
	SRI	1.516	0.271	1.534	0.125	[0.891, 2.582]
	UCLA	1.333	0.235	1.222	0.222	[0.841, 2.115]
	UCSD	1.243	0.211	1.030	0.303	[0.822, 1.879]
	UFL	0.763	0.261	–1.035	0.301	[0.458, 1.273]
	UMB	1.179	0.235	0.699	0.484	[0.744, 1.868]
	UMICH	0.913	0.228	–0.399	0.690	[0.584, 1.428]
	UMN	1.126	0.252	0.471	0.638	[0.687, 1.844]
	UPMC	1.161	0.254	0.587	0.557	[0.706, 1.908]
	UTAH	1.070	0.216	0.315	0.753	[0.701, 1.635]
	UVM	2.084	0.261	2.818	0.005	[1.251, 3.473]
	UWM	0.930	0.243	–0.299	0.765	[0.578, 1.497]
	VCU	1.007	0.280	0.024	0.981	[0.582, 1.741]
	WUSTL	0.923	0.232	–0.344	0.731	[0.586, 1.455]
	YALE	1.210	0.238	0.801	0.423	[0.759, 1.927]

[a] Reference category: Inactive.

[b] Reference category: No Pets.

[c] Reference category: White.

[d] Reference category: Non-Hispanic.

[e] Reference category: Male

[f] Reference category: Boy.

[g] Reference category: Urbanized Area.

[h] Reference category: CHLA.

Table 3.

Pet ownership and youth involvement in sports and other activities multinomial logistic regression full model results.

Outcome Group[a]	Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
Light	(Intercept)	< 0.001	2.773	–3.467	0.001	[0, 0.015]
	Pet[b]					
	Active Pets	0.958	0.210	–0.202	0.840	[0.635, 1.446]
	Passive Pets	0.941	0.246	–0.247	0.805	[0.581, 1.525]
	Parent race[c]					
	Black/African American	0.917	0.621	–0.139	0.889	[0.272, 3.095]
	Asian	0.858	0.717	–0.214	0.831	[0.21, 3.499]
	Pacific Islander	0.001	0.001	–7691.719	< 0.001	[0.001, 0.001]
	Native American	0.001	0.001	–10593.250	< 0.001	[0.001, 0.001]
	Other Race, don't know, or refuse to answer	0.373	0.756	–1.303	0.193	[0.085, 1.644]
	Multiracial	1.390	0.455	0.724	0.469	[0.57, 3.392]
	Youth race[c]					
	Black/African American	0.983	0.621	–0.028	0.978	[0.291, 3.322]
	Asian	0.852	0.817	–0.196	0.844	[0.172, 4.228]
	Pacific Islander	< 0.001	< 0.001	–31501.500	< 0.001	[0, 0]
	Native American	0.006	0.001	–7368.718	< 0.001	[0.006, 0.006]
	Other Race, don't know, or refuse to answer	1.284	0.747	0.334	0.738	[0.297, 5.556]
	Multiracial	0.920	0.359	–0.232	0.817	[0.455, 1.861]
	Parent Hispanic identity[d]	1.677	0.514	1.005	0.315	[0.612, 4.594]
	Youth Hispanic identity[d]	0.545	0.468	–1.296	0.195	[0.218, 1.364]
	Parent gender[e]	1.436	0.300	1.204	0.229	[0.797, 2.588]
	Youth gender[f]	1.302	0.173	1.528	0.127	[0.928, 1.827]
	Parent age	4.035	0.579	2.409	0.016	[1.297, 12.552]
	Youth age	1.175	0.128	1.258	0.208	[0.914, 1.512]
	Number of children in the household	1.031	0.058	0.534	0.594	[0.921, 1.155]
	Income	1.226	0.043	4.776	< 0.001	[1.127, 1.332]
	Walkability	0.949	0.036	–1.466	0.143	[0.884, 1.018]
	Locale[g]					
	Urban cluster	0.671	0.553	–0.722	0.471	[0.227, 1.983]
	Rural	1.201	0.421	0.435	0.664	[0.526, 2.74]
	Population density	1.012	0.006	2.143	0.032	[1.001, 1.024]
	Public parks	0.818	1.262	–0.159	0.874	[0.069, 9.698]
	Site ID[h]					
	CUB	0.590	0.995	–0.530	0.596	[0.084, 4.149]
	FIU	0.811	0.580	–0.362	0.717	[0.26, 2.524]
	LIBR	0.659	0.628	–0.663	0.507	[0.192, 2.258]

Outcome Group[a]	Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
	MUSC	0.957	0.743	–0.059	0.953	[0.223, 4.109]
	OHSU	0.808	0.624	–0.342	0.732	[0.238, 2.744]
	ROC	0.444	0.942	–0.862	0.389	[0.07, 2.813]
	SRI	1.145	0.847	0.160	0.873	[0.218, 6.026]
	UCLA	0.835	0.776	–0.232	0.816	[0.182, 3.824]
	UCSD	0.548	0.618	–0.973	0.331	[0.163, 1.84]
	UFL	0.668	0.693	–0.583	0.560	[0.171, 2.599]
	UMB	1.155	0.656	0.220	0.826	[0.32, 4.177]
	UMICH	0.907	0.634	–0.154	0.878	[0.262, 3.143]
	UMN	0.346	0.785	–1.353	0.176	[0.074, 1.61]
	UPMC	0.790	0.691	–0.341	0.733	[0.204, 3.061]
	UTAH	1.401	0.592	0.570	0.569	[0.439, 4.466]
	UVM	0.592	0.829	–0.633	0.527	[0.117, 3.002]
	UWM	0.993	0.699	–0.010	0.992	[0.252, 3.907]
	VCU	1.147	0.765	0.180	0.857	[0.256, 5.142]
	WUSTL	1.329	0.628	0.452	0.651	[0.388, 4.553]
	YALE	0.612	0.691	–0.710	0.478	[0.158, 2.372]
Moderate-to-Vigorous	(Intercept)	0.003	1.558	–3.696	< 0.001	[0, 0.067]
	Pet[b]					
	Active Pets	1.352	0.121	2.495	0.013	[1.067, 1.715]
	Passive Pets	0.936	0.143	–0.464	0.643	[0.708, 1.238]
	Parent race[c]					
	Black/African American	0.803	0.338	–0.647	0.517	[0.414, 1.559]
	Asian	0.620	0.426	–1.120	0.263	[0.269, 1.431]
	Pacific Islander	0.192	1.123	–1.470	0.141	[0.021, 1.732]
	Native American	0.363	0.640	–1.583	0.113	[0.104, 1.273]
	Other Race, don't know, or refuse to answer	0.682	0.351	–1.091	0.275	[0.343, 1.356]
	Multiracial	0.806	0.270	–0.801	0.423	[0.475, 1.367]
	Youth race[c]					
	Black/African American	0.800	0.342	–0.651	0.515	[0.409, 1.565]
	Asian	0.652	0.483	–0.885	0.376	[0.253, 1.68]
	Pacific Islander	0.041	1.292	–2.471	0.013	[0.003, 0.517]
	Native American	2.087	0.767	0.959	0.337	[0.464, 9.38]
	Other Race, don't know, or refuse to answer	0.931	0.358	–0.199	0.842	[0.462, 1.879]
	Multiracial	0.955	0.204	–0.225	0.822	[0.641, 1.424]
	Parent Hispanic identity[d]	0.867	0.264	–0.538	0.590	[0.517, 1.456]
	Youth Hispanic identity[d]	0.824	0.234	–0.826	0.409	[0.521, 1.304]
	Parent gender[e]	1.338	0.169	1.723	0.085	[0.961, 1.864]
	Youth gender[f]	1.092	0.101	0.871	0.384	[0.896, 1.33]
	Parent age	3.295	0.324	3.684	< 0.001	[1.747, 6.213]

Outcome Group[a]	Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
	Youth age	1.196	0.073	2.450	0.014	[1.037, 1.381]
	Number of children in the household	0.893	0.033	–3.424	0.001	[0.837, 0.953]
	Income	1.360	0.023	13.491	< 0.001	[1.3, 1.422]
	Walkability	1.001	0.022	0.054	0.957	[0.959, 1.045]
	Locale[g]					
	Urban cluster	0.704	0.300	–1.171	0.242	[0.391, 1.267]
	Rural	1.185	0.260	0.652	0.514	[0.712, 1.972]
	Population density	0.998	0.004	–0.473	0.636	[0.991, 1.005]
	Public parks	3.758	0.744	1.778	0.075	[0.873, 16.165]
	Site ID[h]					
	CUB	1.220	0.546	0.363	0.716	[0.418, 3.559]
	FIU	0.497	0.320	–2.187	0.029	[0.265, 0.93]
	LIBR	0.427	0.347	–2.453	0.014	[0.216, 0.843]
	MUSC	0.676	0.439	–0.891	0.373	[0.286, 1.6]
	OHSU	0.427	0.355	–2.393	0.017	[0.213, 0.857]
	ROC	0.576	0.451	–1.223	0.221	[0.238, 1.394]
	SRI	1.452	0.533	0.699	0.484	[0.51, 4.13]
	UCLA	1.572	0.439	1.030	0.303	[0.665, 3.716]
	UCSD	0.725	0.314	–1.027	0.304	[0.392, 1.34]
	UFL	0.278	0.391	–3.272	0.001	[0.129, 0.599]
	UMB	0.845	0.381	–0.442	0.659	[0.401, 1.783]
	UMICH	0.562	0.364	–1.582	0.114	[0.275, 1.147]
	UMN	0.408	0.407	–2.200	0.028	[0.184, 0.907]
	UPMC	0.609	0.366	–1.355	0.175	[0.298, 1.247]
	UTAH	0.547	0.344	–1.749	0.080	[0.279, 1.075]
	UVM	0.931	0.469	–0.153	0.878	[0.371, 2.336]
	UWM	0.601	0.419	–1.216	0.224	[0.264, 1.366]
	VCU	0.686	0.467	–0.807	0.420	[0.275, 1.713]
	WUSTL	0.521	0.370	–1.762	0.078	[0.252, 1.076]
	YALE	0.786	0.389	–0.621	0.535	[0.367, 1.683]

[a]Reference category: None.

[b]Reference category: No Pets.

[c]Reference category: White.

[d]Reference category: Non-Hispanic.

[e]Reference category: Male.

[f]Reference category: Boy.

[g]Reference category: Urbanized Area.

[h]Reference category: CHLA.

Table 4.

Pet ownership and youth physical activity levels binomial logistic regression full model results.

Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
(Intercept)	0.152	0.888	–2.121	0.034	[0.026, 0.861]
Pet[a]					
Active Pets	1.117	0.103	1.069	0.285	[0.914, 1.369]
Passive Pets	0.925	0.127	–0.613	0.540	[0.721, 1.186]
Parent race[b]					
Black/African American	1.132	0.301	0.411	0.681	[0.63, 2.047]
Asian	1.362	0.293	1.053	0.292	[0.757, 2.396]
Pacific Islander	1.457	1.469	0.256	0.798	[0.043, 17.913]
Native American	1.487	0.656	0.605	0.545	[0.382, 5.063]
Other Race, don’t know, or refuse to answer	1.844	0.308	1.985	0.047	[0.991, 3.325]
Multiracial	0.884	0.234	–0.525	0.599	[0.552, 1.385]
Youth race[b]					
Black/African American	0.974	0.296	–0.090	0.928	[0.538, 1.718]
Asian	0.831	0.345	–0.537	0.591	[0.414, 1.604]
Pacific Islander	1.880	1.489	0.424	0.672	[0.057, 28.367]
Native American	1.260	0.656	0.352	0.725	[0.323, 4.281]
Other Race, don’t know, or refuse to answer	0.442	0.343	–2.383	0.017	[0.224, 0.859]
Multiracial	0.965	0.155	–0.230	0.818	[0.707, 1.299]
Parent Hispanic identity[c]	0.630	0.221	–2.093	0.036	[0.41, 0.973]
Youth Hispanic identity[c]	1.225	0.182	1.117	0.264	[0.849, 1.733]
Parent gender[d]	1.376	0.138	2.320	0.020	[1.058, 1.817]
Youth gender[e]	0.542	0.082	–7.451	< 0.001	[0.461, 0.636]
Parent age	0.996	0.007	–0.672	0.502	[0.983, 1.008]
Youth age	0.969	0.058	–0.542	0.588	[0.864, 1.086]
Number of children in the household	0.983	0.031	–0.561	0.575	[0.924, 1.044]
Income	1.032	0.023	1.418	0.156	[0.988, 1.08]
Walkability	0.975	0.015	–1.614	0.106	[0.946, 1.005]
Locale[f]					
Urban cluster	0.867	0.242	–0.591	0.555	[0.526, 1.365]
Rural	0.867	0.151	–0.944	0.345	[0.641, 1.162]
Population density	1.000	< 0.001	–0.631	0.528	[1, 1]
Public parks	1.051	0.444	0.111	0.912	[0.429, 2.447]
Site ID[g]					
CUB	2.066	0.363	2.001	0.045	[1.041, 4.361]
FIU	1.421	0.363	0.968	0.333	[0.714, 2.999]
LIBR	1.415	0.357	0.972	0.331	[0.723, 2.962]
MUSC	2.277	0.372	2.209	0.027	[1.125, 4.89]

Variable	Adj. *OR*	*SE*	*t*	*p*	95% CI
OHSU	1.851	0.348	1.770	0.077	[0.965, 3.812]
ROC	1.233	0.425	0.492	0.623	[0.535, 2.877]
SRI	1.457	0.386	0.976	0.329	[0.695, 3.189]
UCLA	1.503	0.366	1.112	0.266	[0.748, 3.184]
UCSD	1.746	0.341	1.636	0.102	[0.923, 3.551]
UFL	1.601	0.386	1.219	0.223	[0.766, 3.518]
UMB	1.764	0.357	1.590	0.112	[0.9, 3.689]
UMICH	1.788	0.351	1.656	0.098	[0.926, 3.7]
UMN	1.547	0.368	1.185	0.236	[0.77, 3.295]
UPMC	2.032	0.377	1.880	0.060	[0.991, 4.397]
UTAH	1.185	0.348	0.488	0.625	[0.618, 2.441]
UVM	2.321	0.354	2.378	0.017	[1.194, 4.834]
UWM	1.669	0.366	1.399	0.162	[0.834, 3.544]
VCU	1.331	0.415	0.690	0.490	[0.594, 3.063]
WUSTL	0.897	0.381	–0.285	0.776	[0.434, 1.95]
YALE	1.545	0.362	1.204	0.229	[0.781, 3.256]

Note: Reference outcome category: Inactive.

[a] Reference category: No Pets.

[b] Reference category: White.

[c] Reference category: Non-Hispanic.

[d] Reference category: Male.

[e] Reference category: Boy.

[f] Reference category: Urbanized Area.

[g] Reference category: CHLA.

Table 5.

Pet ownership and parent screen time linear polytomous dummy regression full model results.

Variable	Unstandardized *B*	Standardized *β*	*SE*	*t*	*p*
(Intercept)	17.254	–0.237	0.078	–3.049	0.002
Pet[a]					
Active Pets	1.021	0.129	0.027	4.753	< 0.001
Passive Pets	0.524	0.066	0.033	2.025	0.043
Parent race[b]					
Black/African American	2.644	0.333	0.080	4.158	< 0.001
Asian	0.590	0.074	0.081	0.918	0.359
Pacific Islander	–2.076	–0.262	0.415	–0.631	0.528
Native American	5.388	0.679	0.191	3.560	< 0.001
Other Race, don't know, or refuse to answer	0.752	0.095	0.083	1.138	0.255
Multiracial	1.280	0.161	0.060	2.700	0.007
Youth race[b]					
Black/African American	2.781	0.351	0.079	4.429	< 0.001
Asian	–1.172	–0.148	0.092	–1.609	0.108
Pacific Islander	5.850	0.738	0.454	1.623	0.105
Native American	–1.946	–0.245	0.191	–1.284	0.199
Other Race, don't know, or refuse to answer	–0.317	–0.040	0.085	–0.470	0.638
Multiracial	0.281	0.035	0.041	0.855	0.393
Parent Hispanic identity[c]	0.213	0.027	0.059	0.457	0.648
Youth Hispanic identity[c]	0.789	0.099	0.051	1.959	0.050
Parent gender[d]	0.204	0.026	0.034	0.746	0.456
Youth gender[e]	–0.288	–0.036	0.021	–1.736	0.083
Parent age	–0.110	–0.095	0.012	–8.095	< 0.001
Youth age	0.710	0.061	0.011	5.753	< 0.001
Number of children in the household	–0.224	–0.039	0.011	–3.482	0.001
Income	–0.520	–0.150	0.013	–11.412	< 0.001
Walkability	–0.038	–0.018	0.015	–1.166	0.244
Locale[f]					
Urban cluster	–0.517	–0.065	0.065	–1.000	0.318
Rural	0.036	0.005	0.043	0.107	0.915
Population density	0.000	0.007	0.013	0.489	0.625
Public parks	–0.497	–0.005	0.011	–0.513	0.608
Site ID[g]					
CUB	0.199	0.025	0.085	0.296	0.767
FIU	0.930	0.117	0.077	1.523	0.128
LIBR	0.667	0.084	0.079	1.068	0.286
MUSC	0.735	0.093	0.090	1.035	0.301

Variable	Unstandardized *B*	Standardized *β*	*SE*	*t*	*p*
OHSU	0.336	0.042	0.077	0.551	0.582
ROC	–0.250	–0.031	0.096	–0.327	0.743
SRI	–0.928	–0.117	0.088	–1.337	0.181
UCLA	0.697	0.088	0.080	1.099	0.272
UCSD	0.030	0.004	0.073	0.051	0.959
UFL	0.955	0.120	0.090	1.339	0.181
UMB	1.016	0.128	0.080	1.594	0.111
UMICH	0.041	0.005	0.078	0.067	0.947
UMN	–0.311	–0.039	0.083	–0.472	0.637
UPMC	3.079	0.388	0.088	4.428	< 0.001
UTAH	–0.676	–0.085	0.074	–1.149	0.251
UVM	–1.233	–0.156	0.082	–1.902	0.057
UWM	–0.402	–0.051	0.083	–0.608	0.543
VCU	0.251	0.032	0.095	0.331	0.740
WUSTL	0.900	0.113	0.080	1.410	0.159
YALE	1.287	0.162	0.081	2.005	0.045

[a]Reference category: No Pets.

[b]Reference category: White.

[c]Reference category: Non-Hispanic.

[d]Reference category: Male.

[e]Reference category: Boy.

[f]Reference category: Urbanized Area.

[g]Reference category: CHLA.

Author Manuscript

Author Manuscript

Author Manuscript

Table 6.

Pet ownership and youth screen time linear polytomous dummy regression full model results.

Variable	Unstandardized *B*	Standardized *β*	*SE*	*t*	*p*
(Intercept)	5.985	–0.234	0.080	–2.940	0.003
Pet[a]					
Active Pets	1.162	0.120	0.028	4.333	< 0.001
Passive Pets	0.105	0.011	0.033	0.324	0.746
Parent race[b]					
Black/African American	1.264	0.131	0.082	1.594	0.111
Asian	–1.215	–0.126	0.083	–1.515	0.130
Pacific Islander	–5.855	–0.606	0.425	–1.427	0.154
Native American	4.145	0.429	0.195	2.195	0.028
Other Race, don't know, or refuse to answer	0.234	0.024	0.085	0.283	0.777
Multiracial	–0.183	–0.019	0.061	–0.309	0.757
Youth race[b]					
Black/African American	4.462	0.462	0.081	5.696	< 0.001
Asian	0.047	0.005	0.094	0.052	0.959
Pacific Islander	3.792	0.392	0.465	0.844	0.399
Native American	2.596	0.269	0.196	1.373	0.170
Other Race, don't know, or refuse to answer	0.197	0.020	0.087	0.235	0.815
Multiracial	1.704	0.176	0.042	4.160	< 0.001
Parent Hispanic identity[c]	0.718	0.074	0.060	1.237	0.216
Youth Hispanic identity[c]	0.941	0.097	0.052	1.874	0.061
Parent gender[d]	0.098	0.010	0.035	0.287	0.774
Youth gender[e]	–0.108	–0.011	0.021	–0.521	0.602
Parent age	–0.047	–0.033	0.012	–2.753	0.006
Youth age	1.324	0.093	0.011	8.601	< 0.001
Number of children in the household	–0.498	–0.072	0.012	–6.208	< 0.001
Income	–0.462	–0.109	0.013	–8.128	< 0.001
Walkability	–0.040	–0.015	0.016	–0.982	0.326
Locale[f]					
Urban cluster	–0.093	–0.010	0.067	–0.144	0.886
Rural	0.031	0.003	0.044	0.073	0.942
Population density	0.000	0.037	0.014	2.687	0.007
Public parks	–0.314	–0.003	0.011	–0.260	0.795
Site ID[g]					
CUB	–0.913	–0.094	0.087	–1.091	0.275
FIU	3.910	0.405	0.079	5.134	< 0.001
LIBR	0.896	0.093	0.081	1.150	0.250
MUSC	1.011	0.105	0.092	1.141	0.254

Variable	Unstandardized *B*	Standardized *β*	*SE*	*t*	*p*
OHSU	–1.087	–0.112	0.079	–1.427	0.154
ROC	0.195	0.020	0.098	0.205	0.838
SRI	–0.483	–0.050	0.090	–0.558	0.577
UCLA	0.866	0.090	0.082	1.095	0.274
UCSD	–1.905	–0.197	0.075	–2.632	0.009
UFL	0.886	0.092	0.092	0.995	0.320
UMB	0.247	0.026	0.082	0.311	0.756
UMICH	0.509	0.053	0.080	0.658	0.511
UMN	–1.430	–0.148	0.085	–1.740	0.082
UPMC	4.698	0.486	0.090	5.417	< 0.001
UTAH	–3.103	–0.321	0.076	–4.227	< 0.001
UVM	–2.760	–0.285	0.084	–3.410	0.001
UWM	–0.226	–0.023	0.085	–0.274	0.784
VCU	–0.670	–0.069	0.098	–0.710	0.478
WUSTL	1.775	0.184	0.082	2.229	0.026
YALE	1.905	0.197	0.083	2.379	0.017

[a]Reference category: No Pets.

[b]Reference category: White.

[c]Reference category: Non-Hispanic.

[d]Reference category: Male.

[e]Reference category: Boy.

[f]Reference category: Urbanized Area.

[g]Reference category: CHLA.