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BRIEF REPORT

# The Roles of General and Technology-Related Parenting in Managing Youth Screen Time

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This study examines the associations of 2 types of parenting practices—general adaptive parenting and technology-related strategies—with youth screen time. We hypothesized that technology-related parenting focused on behavioral control would relate directly to screen time and serve to link general parenting to screen time. Participants were 615 parents drawn from 3 community samples of families with children across 3 development stages: young childhood (3–7 years; $n = 210$), middle childhood (8–12 years; $n = 200$), and adolescents (13–17 years; $n = 205$). Using structural equation modeling, we found that general adaptive parenting was not related to child screen time but was positively related to technology-related parenting strategies for all 3 samples. For the young and, to some extent, middle childhood samples, but not for the adolescent sample, general adaptive parenting was positively linked to youth screen time through technology-related parenting strategies.

*Keywords:* screen time, media, general parenting, technology-related parenting

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In recent years, access to media has undergone a transformation as mobile devices (e.g., smartphones and tablets) now allow families to provide their child with screen time opportunities throughout the day. Indeed, smartphone and tablet ownership has increased dramatically in the past 5 years (Anderson, 2015), particularly among parents with a minor living in the home (Zickuhr, 2013).

The increasing adoption of these devices has contributed to a rapid rise in screen time exposure for children. Total daily screen time, the summed exposure to devices capable of displaying video content (e.g., smartphones, tablets, computers, televisions, and video game consoles) for children 8- to 18-years-old, has risen from 5 to 7.5 hr since 1999, far exceeding the recommendation of 2 hr or less by the American Academy of Pediatrics (AAP) (Rideout, Foehr, & Roberts, 2010; Strasburger et al., 2013). Excessive screen time in childhood is associated with a variety of physical and behavioral health problems, including increased body mass index (e.g., Wake, Hesketh, & Waters, 2003), academic difficulties (Rideout et al., 2010), and problem behaviors. Longitudinal (e.g., Gentile, Coyne, & Walsh, 2011; Swing, Gentile, Anderson, & Walsh, 2010) and experimental (e.g., Coyne, Archer, & Eslea, 2004) studies support the relationship between screen time and behavioral health.

Despite these concerns, screen time also offers distinct advantages. For example, media use has been linked positively to both academic performance (Wright et al., 2001) and the development of literacy (Bittman, Rutherford, Brown, & Unsworth, 2011). Given these potential benefits, it is not surprising that parents struggle to place adequate boundaries around devices capable of both positive and negative outcomes. Indeed, although they perceive technology use as important to their child's academic and future job success (Ortiz, Green, & Lim, 2011), parents also believe that the excessive use of these devices may negatively affect their child (e.g., sleep) (e.g., Wartella, Rideout, Lauricella, & Connell, 2013). On the basis of the association of excessive screen time with physical and behavioral health and the concern of parents and professionals (e.g., AAP), this study examined the roles of two types of parenting practices—general adaptive parenting and technology-related parenting strategies focused on behavioral control—in a child's daily screen time.

General adaptive parenting practices are important in a child's development. Two components of such parenting are (1) warmth, positive reinforcement, and involvement and (2) behavioral control (e.g., consistent discipline and rule-setting) (see McKee, Jones, Forehand, & Cuellar, 2013, for a review). These parenting strategies have been linked to higher levels of children's competence and lower levels of child problem behaviors (McKee et al., 2013). Furthermore, these parenting behaviors may be related to less screen time (e.g., Pressman, Owens, Evans, & Nemon, 2014).

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However, the research to date has not addressed whether these parenting behaviors are sufficient to reduce screen time or whether more specific behavioral control strategies are necessary. That is, technology-related parenting strategies may be distinct from general adaptive parenting behaviors in that parents utilizing these strategies are able to set rules and boundaries specifically around their child's technology use (e.g., setting passwords and parental controls). The distinction between these two types of parenting behavior is important: Parents, who may be utilizing general adaptive parenting strategies, frequently report confusion or difficulties specific to the management of their child's use of media devices in the home (e.g., Wartella et al., 2013). However, when parents do use rules specifically about media, there appears to be a reduction in children's screen time (Ramirez et al., 2011; Vandewater, Park, Huang, & Wartella, 2005). The current study examines the relationship of both general adaptive parenting skills and technology-related parenting strategies with children's daily screen time. We hypothesize that technology-related parenting focused on behavioral control of screen time will relate directly to child screen time, whereas general adaptive parenting will be linked indirectly, but not directly, to child screen time through technology-related parenting strategies.

We also address two limitations in the existing literature on child screen time. First, in contrast to prior research, we examine total screen time across multiple devices in the home, including newer devices. Specifically, we include tablets, which spurred by the release of the iPad in 2010, have been rapidly adopted in the United States, particularly for families with children (Zickuhr, 2013). Second, a broad range of a child's developing years from preschool through adolescence has not been examined. Parents may have different expectations and exert varying degrees of control for screen time depending on a child's age. Drawing from studies focused on selected age ranges, rules for and monitoring of various types of screen time appear to decrease as children age (Rideout et al., 2010; Rosen, Cheever, & Carrier, 2008; Wartella et al., 2013). However, the absence of samples across the full developmental age range within a study and the examination of usage of different screens (e.g., Internet, TV) across studies make it difficult to reach conclusions across developmental stages about the role of parenting in children's screen time. We hypothesize that parenting will have less influence on screen time as children increase in age. The three age groups we examine—young childhood (3–7 years), middle childhood (8–12 years), and adolescence (13–17 years)—were chosen on the basis of typical age divisions of parenting prevention and intervention programs (e.g., young children: McMahon & Forehand, 2003; middle childhood: Kazdin, 2005; adolescence: Patterson & Forgatch, 2005). Our findings can inform the development of programs to help parents manage their children's screen time at different developmental stages.

# Method

## Participants

Parents were recruited online through Amazon's Mechanical Turk (MTurk). MTurk is currently the dominant crowdsourcing application in the social sciences (Chandler, Mueller, & Paolacci, 2014), yielding data that are as reliable as those obtained via more traditional data collection methods (e.g., Buhrmester, Kwang, & Gosling, 2011). A sample of 615 parents responded to a study that was listed separately for three age groups: young childhood (3- to 7-year-olds; $n = 210$), middle childhood (8- to 12-year-olds; $n = 200$), and adolescents (13- to 17-year-olds; $n = 205$). Demographics by sample (young, middle, and adolescent samples) are presented in the online Appendix (see Supplemental Material). The sample was similar across the three age groups and was predominantly White (77.2%), married or cohabiting (80.0%), and college educated (84.9%), with incomes primarily in the $30,000 to $69,000 range (46.3%). Both mothers (54.4%) and fathers (45.6%) and girls (43.1%) and boys (56.9%) were represented.

## Procedure

All study procedures were approved by the University of Vermont institutional review board. All parents consented online before beginning the survey. For families with multiple children in the target age range, one child was randomly selected through a computer algorithm, and measures were asked in reference to parenting specific to this child. Participants were recruited from MTurk under the restriction that they were U.S. residents and had at least a 90% approval rate for their previous tasks. Ten attention-check items were placed throughout the online survey. Participants ($N = 9$) were not included in the study (i.e., their data were removed from the dataset) if they had more than one incorrect response to these 10 check items to ensure that responses were not random or automated.

## Measures

**Demographic information.** Parents responded to demographic questions about themselves, their families, and the target child.

**General adaptive parenting.** The positive parenting and lax discipline subscales of the Multidimensional Assessment of Parenting Scale (MAPS; Parent & Forehand, 2014) assessed two components of general adaptive parenting (i.e., warmth/positive reinforcement/involvement and behavioral control). MAPS items were selected and adapted from nine well-established parenting scales (e.g., the Alabama Parenting Questionnaire, Frick, 1991; the Parenting Practices Questionnaire, Block, 1965; the Parenting Scale, Arnold, O'Leary, Wolff, & Acker, 1993). Initial reliability and validity data are favorable (Parent, McKee, Rough, & Forehand, 2015) (also see the online Appendix). Items are rated on a 1 (*never*) to 5 (*always*) scale.

The 11-item positive parenting subscale included items representing expressions of warmth and affection (e.g., "I express affection by hugging, kissing, and holding my child"), positive reinforcement (e.g., "If I give my child a request and she/he carries out the request, I praise her/him for listening and complying"), and supportive parent–child communication (e.g., "I encourage my child to talk about her/his troubles"). The 9-item lax discipline subscale included items representing inconsistent discipline (e.g., "If my child whines or complains when I take away a privilege, I will give it back") and permissive parenting (e.g., "I am the kind of parent who lets my child do whatever he/she wants"). This subscale was reverse-scored to represent behavioral control. Averaged across the three samples, the reliability of the general positive parenting ($\alpha = .90$) and lax discipline ($\alpha = .86$) subscales was excellent.

**Technology-related parenting strategies (TPS).** Parents responded to eight questions that described rules (e.g., "limits on the

amount of time," and "limits on the type of content allowed") and enforcement strategies (e.g., "Consequences if the child accesses when not allowed," and "Passwords on these devices") they potentially use to exert behavioral control over their child's screen time in the home. For each item, parents rated how true it was for them in the last month on a Likert scale ranging from 0 (*not true*) to 2 (*very true*). Higher scores reflect more behavioral control of child technology use. Reliability across the three samples was excellent ($\alpha = .87$). See the online Appendix for further details.

**Child weekly screen time.** Parents were asked two questions regarding their child's screen time. First, they were asked "Now thinking about [target child]'s typical activities, on a typical *weekday* how much time does [target child] spend doing each of the following at home?" Then, parents were asked the same question about their child's weekend. Parents responded with the number of daily hours or minutes their child engaged in each of the following activities: (a) watching TV or DVDs, (b) using the computer, (c) playing video games on a console game player (e.g., Xbox, Playstation, Wii), (d) playing on a handheld game console (e.g., Gameboy, PSP, or DS), (e) using a tablet computer (e.g., iPad), and (f) using a smart phone for things like playing games and surfing the Internet (excluding time spent talking on the phone). A daily use (averaged across the weekend and weekday) was calculated by device and then summed across all devices. This sum was used as our interest was in total screen time rather than time in front of any specific device. This method is similar to those used in psychological research (e.g., Gingold, Simon, & Schoendorf, 2014) and industry reports (e.g., Rideout et al., 2010).

## Data Analytic Plan

**Preliminary analysis of demographic and study variables.** The relation of demographic variables (i.e., parent age, gender, race, education; family income, marital status; child age and gender) to the primary outcomes was examined using bivariate correlations. When significant, that demographic variable was controlled in primary analyses. Correlations among study variables also were computed.

**Evaluation of the measurement model.** A one-factor confirmatory factor analytic measurement model was estimated for each age group prior to estimating a structural model in order to test the fit of the factor structure of the TPS and to determine the factor loadings for each indicator.

**Evaluation of the structural model.** Structural equation modeling to test the hypothesized model for each age group was conducted with Mplus 6.1 software (Muthén & Muthén, 2010). To account for skewed data, maximum likelihood estimation with robust standard errors was used. The following fit statistics were used to evaluate model fit: chi-square ($\chi^2$: $p > .05$ excellent), comparative fit index (CFI; >.90 acceptable, >.95 excellent), root-mean-square error of approximation (RMSEA; <.08 acceptable, <.05 excellent), and the standardized root-mean-square residual (SRMR; <.08 acceptable, <.05 excellent) (Hu & Bentler, 1999). Because missing data were less than 1% overall for all core variables, the mechanism of missingness was treated as ignorable (missing at random), and full information maximum likelihood estimation techniques were used for inclusion of all available data. The significance of the indirect effect of general adaptive parenting on youth screen time through technology-related parenting and the ratio of the indirect effect to the total effect (*ab*/*c*) for each significant indirect effect test were calculated.

**MIMIC models.** Although not included in the proposed conceptual model, the effects of significant control variables (e.g., parent gender, child gender, family income) on the model were examined by running a multiple-indicator/multiple-cause (MIMIC; Muthén, 1989) model in which all major constructs of the final model were regressed on the covariates separately. If paths in the structural model remained significant with the inclusion of these covariates, it was concluded that the control variables did not influence the relations among variables in the model.

# Results

## Preliminary Analysis

Screen time for young childhood, middle childhood, and adolescents was 7.36, 8.47, and 9.92 hr daily, respectively. Prior to preliminary analyses, three demographic variables were dichotomized: race: White (1) or a person of color (2); marital status: single (1) or in a relationship (2); and parent education: some college or less (1) or college degree or more (2). Correlations between each of the eight demographic variables and both child screen time and technology-related parenting were conducted separated by each sample and served as covariates in MIMIC models when significant. For the young childhood sample, parent age, parent gender, parent education, and child gender were significantly correlated with at least one outcome variable. For the middle childhood sample, parent age and marital status were associated with at least one outcome variable. For the adolescent sample, number of children in the family was significantly associated with at least one outcome variable. Bivariate correlations in all samples indicated that positive parenting and behavioral control were related to technology-related parenting (all $r$s $> .30$, $p < .01$). Positive parenting was only correlated with screen time in young childhood, and behavioral control was significantly correlated with screen time for all samples (all $r$s $> .16$, $p < .05$). Technology-related parenting was correlated with screen time in all three samples (young childhood $r = -.24$, $p < .01$; middle childhood $r = -.15$, $p < .05$; adolescence $r = -.14$, $p < .05$).

## Primary Analyses

**Evaluation of the measurement model.** In all models, the first indicator for each latent factor was set at 1.0 to establish the metric, and all factors were allowed to covary freely. Inspection of the initial measurement model using modification indices suggested including correlated error terms for four pairs of indicators of the technology-related parenting latent construct (e.g., "limits on when it can be accessed" and "place limits using parental control features") would improve fit. Across all three samples, factor loadings were significant and are displayed in the online Appendix. The final measurement model demonstrated good to acceptable fit for the young childhood samples, $\chi^2(16, N = 210) = 30.47$, $p < .05$, RMSEA = .07, 95% confidence interval (CI) [.03, .10], CFI = .97, SRMR = .04; middle childhood samples, $\chi^2(16, N = 200) = 24.00$, $p = .09$, RMSEA = .05, 95% CI [.00, .09], CFI = .98, SRMR = .04; and adolescent samples, $\chi^2(16, N = 205) = 33.58$, $p < .05$, RMSEA = .07, 95% CI [.04, .11], CFI = .97, SRMR = .04.

**Evaluation of the structural model (SEM).** The proposed model fit ranged from good to acceptable for the young childhood samples, $\chi^2(37, N = 210) = 81.77$, $p < .01$, RMSEA = .08, 95% CI [.05, .10], CFI = .93, SRMR = .05; middle childhood samples, $\chi^2(37, N = 200) = 64.51$, $p < .05$, RMSEA = .06, 95% CI [.03, .09], CFI = .96, SRMR = .05; and adolescent samples, $\chi^2(37, N = 205) = 74.94$, $p < .01$, RMSEA = .07, 95% CI [.05, .09], CFI = .94, SRMR = .05.

Figure 1 presents the pathways and standardized estimates for each sample. Positive parenting and general behavioral control were related to technology-related parenting across all three samples such that higher levels of both positive parenting and general behavioral control were related to higher levels of setting and enforcing rules about their child's technology use. Neither positive parenting nor general behavioral control was directly related to screen time in any of the three samples. Technology-related parenting was significantly related to young childhood screen time, marginally related to middle childhood screen time, and not significantly related adolescent screen time. Thus, higher levels of setting and enforcing rules about children's technology use was related to less youth screen time for younger children. Positive parenting ($p = .045$) and behavioral control ($p = .08$) were indirectly related to young children's screen time through technology-related parenting. The ratio of the indirect effect to the total effect for positive parenting and behavioral control on young children's screen time was 62% and 49%, respectively.

Two post hoc analyses were conducted. First, separate models were tested with only positive parenting or only behavioral control in order to ascertain individual (rather than unique) effects of two parenting behaviors. Across all three samples, paths from each of these behaviors were unchanged in these separate models. However, one difference did emerge: Technology-related parenting was significantly related to screen time in the behavioral-control-only and positive-parenting-only models for middle childhood ($\beta$s = .17, $p = .05$) and the positive-parenting-only model for adolescents ($\beta = .16$, $p = .048$). Second, because associations between technology-related parenting and screen time were not consistently significant across developmental stages, we conducted post hoc analyses and found that parents used lower levels of this type of parenting ($p < .05$) with adolescents than with the young ($M$ = 9.66 vs. 10.59, $p < .05$) or middle ($M$ = 9.66 vs. 10.92, $p < .01$) childhood samples.

**MIMIC models.** The effects of significant covariates were tested by running MIMIC models. For the young childhood and adolescent samples, all pathways were unaffected by the inclusion of the covariates in the model. For the middle childhood sample, the path from technology-related parenting strategies to youth screen time was reduced slightly (from $p = .10$ to $p = .11$ or .12, depending on the covariate) because of increased standard errors, but had a standardized estimate close to original values (−.15 to −.14). Overall, paths across samples were largely unaffected by the inclusion of control variables; thus, it was concluded that the control variables did not influence the original relationships among variables in the model.

## Discussion

Youth screen time far exceeded the 2 hr recommended by AAP for all age groups. On the basis of a literature indicating that excessive screen time by youth is associated with a host of behav-

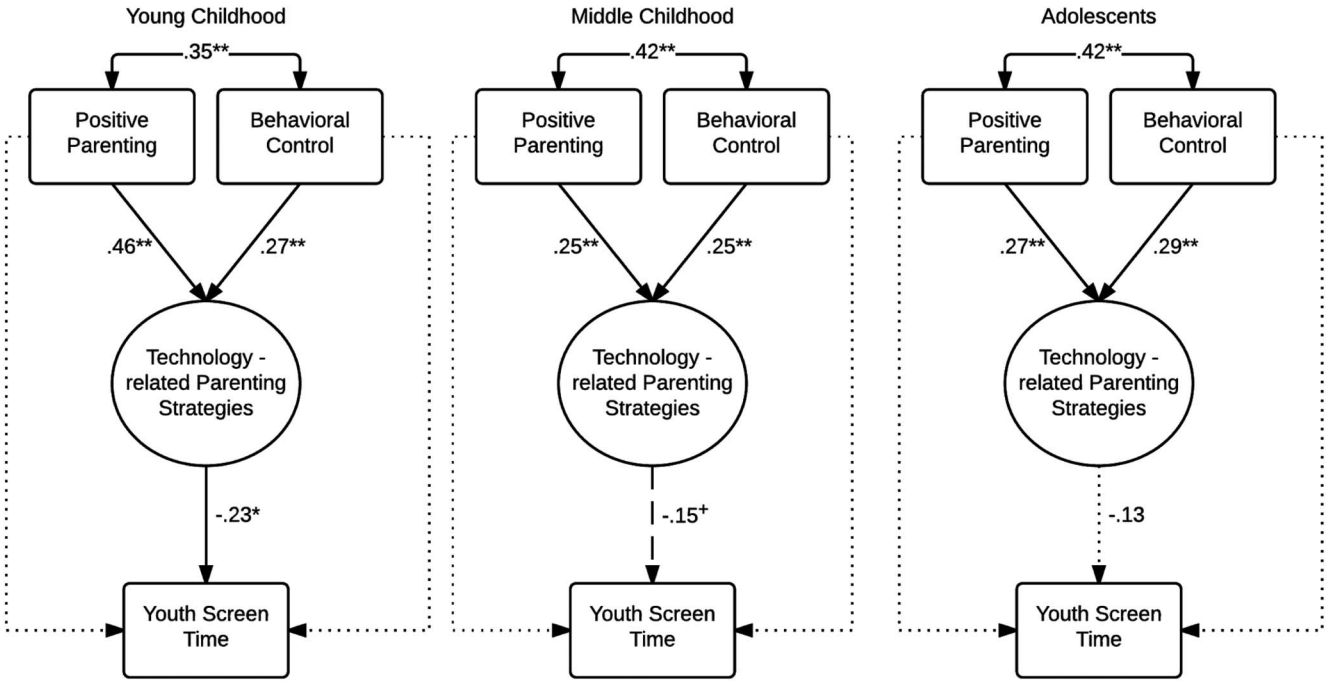


*Figure 1.* Model examining direct and indirect effects of two components of general adaptive parenting (positive parenting and behavioral control) on child screen time through technology-related parenting strategies. + $p \leq .10$. * $p < .05$. ** $p < .01$.

ioral and physical problems, we examined whether technology-related parenting focused on behavioral control would be associated with child screen time and serve to link general adaptive parenting strategies to screen time. We also examined whether parenting would have less influence on screen time as children age. Our model was supported for the young childhood age range and received increasingly less support as children increased in age.

Both of the components of general adaptive parenting were positively associated with the use of technology-related parenting practices at all ages of development. This link is perhaps not surprising because general adaptive and area-specific (in this case, technology) parenting strategies may constitute two facets of general parenting skills. However, what is surprising is that in our primary analyses, general adaptive parenting was not directly related to screen time at any of the three developmental stages. These findings suggest that the use of general adaptive parenting strategies may be important for children's screen time but only in the context of specific rules about and enforcement strategies for media access. These results are important, because the majority of parents do not utilize rules around the quantity of media use (Rideout, et al., 2010).

Parental use of rules and enforcement strategies for screen time access was associated with less child screen time for children in the young, and to some extent middle, childhood years, in our primary SEM analyses, echoing the importance of parental rules and enforcement strategies for technology use (Ramirez et al., 2011; Vandewater et al., 2005). Our assessment of these strategies include not only rules around technology use, but also the use of parental controls and passwords to prevent access to media devices in the home. Prior research suggests that the use of parental control devices may improve the efficacy of intervention efforts to reduce child screen time (Maniccia, Davison, Marshall, Manganello, & Dennison, 2011). Overall, the present findings suggest that, at least for young children, screen time may best be managed through rules and enforcement strategies around technology use in the home, guided by parents who utilize warmth and clear communication with their children.

Although correlational and post hoc analyses suggested an association between technology-related parenting and screen time in all three age samples, this association diminished in our primary analyses as children increased in age. This finding is congruent with prior research (Livingston & Helsper, 2009). Other research suggests that attempts at enforcing media access rules may even be detrimental with adolescents because they seek screen time outside of the home through peers (e.g., Lee, 2013). Given that adolescence is a time in which youth strive for independence (Zimmer-Gembeck & Collins, 2003), parental attempts to restrict their adolescent's access may appear overly intrusive, encouraging the rejection of the parent's rules. As we and Rideout et al. (2010) found, parents may therefore have fewer rules and enforcement strategies for adolescent age youth. Thus, screen time interventions may be particularly challenging for parents of adolescents, and at least moderately challenging in middle childhood, suggesting the potential importance of implementing effective screen time management strategies with children during their earlier years. Of course, strategies will need to be changed as children age and as technological devices evolve. In addition, longitudinal data are needed to examine whether managing screen time in young children does have implications for technology usage as youth age.

Limitations in the present study should be noted. First, the cross-sectional nature of the data does not allow for causal conclusions from the present model. Second, the present study is limited by a lack of multiple informants. Self-report of adolescents could be included in future research. Third, although our measure of screen time was based on an established measure (e.g., Gingold et al., 2014; Rideout et al., 2010), it was limited to a parent estimate of youth screen time. Daily diaries would improve the assessment of this construct. Fourth, the focus on negative effects of screen time precluded the examination of potential positive effects of screen time. Fifth, our study examined screen time collapsed across a number of devices (e.g., TV, hand-held games, iPads) rather than examining individual devices. We view this investigation as a first step with subsequent studies examining type of device and whether the role of parenting differs by device. Finally, the demographics of the sample (primarily Caucasian, middle socioeconomic status) limit the generalizability of the findings.

Strengths in the present study include the use of rigorous analytical strategies to test a model incorporating general adaptive parenting, technology-related parenting strategies, and child screen time; these results provide an important conceptual and analytical basis for future research on this topic. In addition, a large community sample across three developmental age ranges allowed us to identify changes among the variables of interest as children grow older.

The present findings suggest that general adaptive parenting strategies are not sufficient in the management of their child's screen time; however, this does not mean these parenting strategies are unimportant. They likely contribute to the successful implementation of technology-related rules and enforcement strategies. Our findings suggest that parents struggling to manage their child's screen time may benefit from specific resources or guidance around setting boundaries and improving their ability to set limits on their child's access to media devices. Family psychologists hopefully will develop, evaluate, and then disseminate these resources, which likely should include implementing rules and enforcement strategies in young childhood when these parenting practices are most effective.

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