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Maternal autonomy support and children's social competencies, academic skills, and persistence: Social determinants and mediation

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Maternal Autonomy Support and Children's Social Competencies, Academic Skills, and Persistence: Social Determinants and Mediation Effects

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Abstract

Drawing on self-determination theory, family stress theory, and the social determinants of health framework, the current study sought to evaluate direct and indirect relationships among socioeconomic status (maternal education and income), parenting stress, autonomy supportive parenting behavior, and children's positive outcomes (e.g., social competences, academic skills, and persistence) using a racially diverse sample from low-income backgrounds. Using data on 2,233 children collected at birth (T1), age 5 (T2) and age 9 (T3) as part of the Fragile Families and Child Wellbeing study, a structural equation model was tested in *M*Plus. Associations among main constructs were tested in a single structural model and mediation effects were subsequently evaluated using a bias-corrected bootstrap method. Autonomy supportive parenting was directly and positively associated with all three positive outcomes evaluated in children (e.g., social competences, academic skills, and persistence). Maternal education at child's birth was directly related to autonomy supportive parenting, and maternal income at birth was indirectly associated with autonomy supportive parenting through the mediating mechanism of maternal parenting stress. Autonomy supportive parenting was also found to mediate associations between parenting stress and children's social competences, academic skills, and persistence. Parenting education and intervention programs that focus on teaching parents how to avoid or manage stress and be autonomy supportive may benefit children's positive development. It is also important, however, for policy makers, educators, and practitioners who work with parents to recognize the impact of socioeconomic constraints that may impact parenting behaviors and choices.

Keywords: Academic Skills, Fragile Families & Child Wellbeing Study, Parental Autonomy Support, Persistence, Social Competence

Highlights:

- Evaluates longitudinal parenting and positive child outcomes among fragile families;
- Income, education, and stress function as antecedents of maternal autonomy support;
- Maternal autonomy support is associated with child social and academic success.

Maternal Autonomy Support and Children's Social Competencies, Academic Skills, and Persistence: Social Determinants and Mediation Effects

Self-determination theorists propose that human beings have fundamental psychological needs for a sense of autonomy, competence, and relatedness (Deci & Ryan, 2002). When these needs are met, it is suggested, individuals are better able to thrive, flourish, and adapt to their surrounding environments (Deci & Ryan, 2002). Autonomy, as one of these basic needs, refers to a sense of volition or agency that individuals' thoughts, ideas, opinions and feelings are recognized and respected (Deci & Ryan, 2002). Parents who are autonomy supportive are likely to have the belief that children are innately motivated and capable of adapting to new environments (Deci & Ryan, 2002). Parental autonomy support is demonstrated by parents when they respect children's perspectives, acknowledge their children's feelings, give reasons and explanations for rules, and provide guidance when needed. Parents' respect of children's autonomy does not mean letting children do all things on their own and being distant. Instead, it involves providing guidance when needed, giving explanations and reasons when talking about rules and goals, and acknowledging children's feelings and perspectives on (Grolnick & Ryan, 1989; Grolnick et al., 2002; Whipple et al., 2011). Autonomy supportive parenting is believed to facilitate children's ability to read parents' messages accurately, willingly and gradually internalize message from parents, and eventually achieve optimal integration with social-cultural structures (Deci et al., 1994; Grolnick et al.,1997; Ryan & Deci, 2002).

As predicted in self-determination theory (SDT), there is increasing evidence that when caregivers support children's autonomy, children, regardless of their developmental stages, are more likely to flourish and succeed in social relationships and academics (Grolnick et al., 1991; Grolnick, 2009; Ispa et al., 2015; Joussemet et al., 2005; NICHD, 2008). Autonomy supportive parenting has been demonstrated to contribute to children's emotional wellbeing (Chirkov et al., 2003; Lekes et al., 2010; Niemiec et al., 2006) and to broadly help foster children's learning and achievement (e.g., Cheung & Pomerantz, 2011; Joussemet et al., 2005; Vansteenkiste et al., 2005). Previous research has provided extensive evidence that parental autonomy support links to children's social competences and reduced experiences of negative internalizing or externalizing behavior (Brenning et al., 2015; Joussemet et al., 2005; NICHD, 2004; Van der Giessen et al., 2014). Using data collected in the 1950's, Joussemet and colleagues (2005), found parents who scored high on reasoning, recognizing children's feelings, offering choices and encouraging initiatives, and who minimized the use of parental control were likely to have children who scored well on social adjustment (three items: "shows a conscience," "not impulsive," and "does not quarrel with

other children") concurrently at age 5. In a similar vein, NICHD (2004) evaluated associations between teacher reported children's social competences (Social Skills Rating System; Gresham & Elliott, 1990), and parental sensitivity, which consisted of a composite score including parents' respect for autonomy, supportive presence, and a reversed score for hostility.

Not only does parental autonomy support benefit children's social competences, it also contributes to children's academic achievement (Grolnick et al., 1991; Grolnick, 2009; Joussemet et al., 2005; NICHD, 2008; Pedersen, 2017). As revealed in Grolnick and colleagues' (1991) work, children's (Grades 3-6) perceived parental autonomy support was positively related to their class performance, math and reading scores, and teacher reported school-related competences. School related competences included three subscales: academic competence, motivation, and independence of school work completion. Similar results were found about a decade later (Joussemet et al., 2005) when parental autonomy support (measured at age 5) was found positively related to children's academic adjustment and reading achievement concurrently and later at age 8. Academic adjustment in Joussemet and colleagues' study (2005) tapped on desirable academic behaviors that reflected schoolwork completion and concentration in class.

Autonomy supportive parenting may also promote the development of persistence (i.e., characteristics of sticking to a goal, not giving up until the goal is achieved) in children (Froiland, 2015; Ratelle et al., 2005). In the field of parent-child relationship research, autonomy supportive parenting has been shown to be related to children's increased task persistence in elementary school contexts (Viljaranta et al., 2018), and as a particularly valuable form of self-regulation that contributions to positive long-term developmental trajectories (Tough, 2012). Froiland (2015) found that in weekly journals, parents reported children engaged in increased persistence in their school work and assignments while participating in an intervention designed to promote parental autonomy support. Furthermore, research with college students has demonstrated that young adults who report having parents who are autonomy supportive are more likely to maintain enrollment in challenging science curriculum as compared to peers who perceived their parents as less autonomy supportive (Ratelle et al., 2005). Taken in full, these previous findings provide evidence for expecting a link among the constructs of autonomy-supportive parenting and children's social competences, academic skills, and persistence.

Given the important contribution of parental autonomy support to children's developmental competences, investigating possible antecedents of autonomy support is critical for understanding what fosters (or limits)

caregivers' autonomy supportive competences and strategies. Little empirical evidence has investigated what factors contribute to or predispose parents to engage in autonomy supportive behaviors. Theoretical models such as the family stress model (Conger & Donnellan, 2007) and the social determinants of health (SDOH) framework, however, each provide theoretical justification for examining the role of social resources and positions in effecting the capability or constraints on parents' ability to engage in autonomy supportive parenting behaviors (Russell et al., 2018; Viner et al., 2012). According to Conger's family stress model (Conger et al., 1991; Conger et al., 1992; Conger et al., 2002), in the context of economic hardships, parents may be less likely to engage in autonomy supportive parenting practices. Previous research has demonstrated that lack of financial security might be an antecedent to parents' psychological distress which in turn can undermine the quality of parenting (Conger et al., 1992).

Conger and colleagues (1992) family stress model also suggests that a relationship between family economics and autonomy supportive parenting behaviors may be mediated by experiences of parenting stress. In Conger and colleagues' early work with families from primarily White middle-class backgrounds (e.g., Conger et al., 1992), and later in a replication study focused on African American families (Conger et al., 2002) it was demonstrated that economic and relational stressors where linked first to lower quality caregiving and subsequently to children's increased behavioral problems. On the other hand, however, in an analysis of young children attending head start and private daycare centers in Baltimore, Anthony and her colleagues (2005) found that though parenting stress in early childhood was linked to children's social competences and behavioral problems, the relationship among these variables did not appear to be mediated by parenting behaviors (expectations, discipline, and nurturing). Still, Conger, Conger, and Martin (2010) have recently discussed the benefits of drawing on a social causation perspectives to evaluate how socioeconomic disadvantages link to variations in individuals' health and wellbeing, and can serve to supplement the traditional family stress model. The Social Determinants of Health framework (SDOH; Currie et al., 2012; Viner et al., 2012) provides a useful set of theoretical principles for evaluating how factors like family affluence and education can impact the environments in which individuals make relational decisions (such as those regarding parenting behaviors and the development of parent-child relationships) that ultimately impact their children's growth, development, and wellbeing (Currie et al., 2012).

Whereas the family stress model focuses predominately on internal family dynamics and how perceptions of stressors impact parenting, the SDOH framework points to the important contribution of social status and

positions on impacting parenting behaviors. Within the SDOH framework, family members' education and income status reflect social determinants that may restrain or support the ability of parents to maintain the health and wellbeing of child and adult family members (Currie et al., 2012). Wealth and educational prestige may benefit some parents by providing them access to resources like parenting knowledge, professional advice (from certified educators), or confidence in their own skills and in their child's inclination for success (Azmoude et al., 2015; Bornstein et al., 2010). Whereas being impoverished or lacking education might incur more doubt, stress, or lack of certainty in one's own or child's behaviors or competence (Azmoude et al., 2015; Bornstein et al., 2010). This differential access to both physical and intangible resources in turn may impact the parenting behaviors parents choose (or are able) to engage in (Currie et al., 2012). When included in statistical models, however, such factors are generally conceptualized and modeled as control variables that need to be accounted for regarding only their direct impacts on the outcome of interest (Ispa et al., 2004; Russell et al. 2018). Rarely do social science researchers consider social statuses explicitly as antecedents of parenting behaviors (Bornstein, 2010; Russell et al., 2018). The SDOH framework, however, provides theoretical justification for such a reconceptualization and for paying particular attention to how early experiences might limit or benefit later outcomes (Currie et al., 2012; Russell et al., 2018). As an example of pre-existing research that supports this alternative approach to analysis, Joussemet and colleagues (2008) demonstrated in a study conducted with Canadian and Norwegian mothers that mothers in Norway had higher trust in children's organismic development in part because of higher levels of social resources and welfare they could receive in their country compared to Canadian mothers. The trust in organismic development was found directly related to parents' levels of autonomy support. It is possible that perceived social resources could operate as structural factors able to limit or promote parents' engagement in autonomy supportive parenting behaviors.

Much of the previous research on parental autonomy support has been conducted with children from relatively affluent and racially homogenous families (e.g., white and middle to upper-class married families; Brenning et al., 2015; Grolnick et al., 1991; Joussemet et al., 2005; NICHD, 2008). As such, previous studies in this area have not truly reflected the demographic reality of the U.S. in terms of the diversity of compositions of a variety of racial groups, family structures, and economic statuses. In addition, much of the extant literature evaluating the effects of stress on parenting have focused on how stress is associated with deficits in parenting or child outcomes, particularly negative internalizing or externalizing behavior. As resilience researchers and positive

psychologists have argued, however, it is also important to explore predictors of positive aspects of parenting (e.g., autonomy supportive parenting), and how to promote positive child outcomes (such as critical skills and strengths in social competences, academic achievements, and persistence; Seligman & Csikszenthmihalyi, 2000; Wright et al., 2013). This focus on strengths is particularly necessary in the context of research on racially diverse, structurally diverse, and low-income families for whom narratives of risk and deviancy are often overabundant and (mis)used to further justify harsh sanctioning or censoring of families and communities (Letiecq, 2019; Rao & Donaldson, 2015; Russell et al., 2018). Understanding the associations and potential mediating relationships among socioeconomic status, parenting stress, parenting behaviors, and child outcomes can help inform more effective interventions with parents and children and provide a more comprehensive understanding of children's social and academic development.

Drawing on the family stress model, the social determinants of health framework, and self-determination theory, we sought to test a conceptual model (see Figure 1) using data from the Fragile Families and Child Wellbeing study collected at or shortly after children's birth (baseline; T1), again when children were age 5 (T2), and a third time when they were age 9 (T3). Specifically, we sought to evaluate hypothesized direct and indirect relationships among socioeconomic status (maternal education and income), parenting stress, autonomy supportive parenting behavior, and children's positive outcomes (e.g., social competences, academic skills, and persistence) using a racially diverse sample from low-income backgrounds. After evaluating the overall fit of the model, we conducted two sets of mediation tests. First, we evaluated whether autonomy supportive parenting serves as a mediator of the association between maternal parenting stress and children's social competences, academic skills, and persistence. Second, we tested whether parenting stress serves as a mediator of the association between socioeconomic status (e.g. income and level of education) and maternal autonomy supportive parenting. Our specific hypotheses were:

H1. Perceived maternal autonomy support (T3) would have direct concurrent positive associations with children's social competences, academic skills and persistence (T3).

H2. Maternal parenting stress (T2) would have direct prospective negative associations with children's social competences, academic skills, and persistence (T3).

H3. Maternal socioeconomic status (education and income; T1) would have direct prospective negative associations with maternal parenting stress (T2) and positive associations with maternal autonomy support (T3).

H4. Maternal socioeconomic status (education and income; T3) would have direct concurrent positive associations with children's social competences, academic skills and persistence (T3).

H5. Perceived maternal autonomy support (T3) would mediate the associations between maternal parenting stress (T2) and children's social competences, academic skills, and persistence (T3).

H6. Maternal parenting stress (T2) would mediate the association between maternal socioeconomic status (education and income; T1) and perceived maternal autonomy support (T3).

<Figure 1 about here>

Methods

Data for this analysis were drawn from the Fragile Families and Child Wellbeing Study, which followed a cohort of 5,000 children born in 20 large U.S. cities between 1998 and 2000 to predominately unmarried and/or low-income couples (Princeton University, 2019). Children were followed throughout their childhood and at various ages had data collected from their parents, teachers (during school years), and through various self-report and observational methods (Princeton University, 2019). Three waves of data were utilized in the current study: baseline before or right after children were born (T1), when children were 5 years old (T2), and when children were 9 years old (T3). Given that the prominent child outcome data were at T3, we selected our sample to only include children for whom data was reported on at T3 on the primary outcomes of interest (social competences, academic skills, and persistence). As a result, our final sample consisted of data on 2,233 children.

Participants

Our final sample consistent of reports on 1159 boys (51.9%), and 1074 girls (48.1%). Children's average age at T3 was 9.25 years old (*SD* = .34; range = 8.62-10.88 years). Mothers' average age at T3 was 34.49 years old (*SD* = 6.07 years, range = 23-54 years). Mothers were from diverse backgrounds in terms of their race, socioeconomic status, and relationship status (see detailed demographics in Table 1).

<Table 1 about here>

Measures

Socioeconomic Status

Maternal education and mother's household income were used to reflect family's socioeconomic status. Mothers at T1 and T3 were asked to report their education level, from 1 = *less than high school education* to 4 = *college or graduate level education*. Mother's household income at both T1 and T3 were measured at 5 different levels according to federal poverty guidelines (1 = *0-49%*; 2 = *50-99%*, 3 = *100-199%*, 4 = *200-299%*, and 5 = *300% and above*). These aspects of socioeconomic status were included in the model as independent observed (manifest) variables.

Maternal Parenting Stress

Maternal parenting stress was measured with four items included in the Fragile Families and Child Wellbeing Study that were originally from the Parent Stress Inventory (Abidin, 1995). Items were measured on a 4-point Likert scale (1 = *strongly disagree*, 4 = *strongly agree*). A composite score was created by averaging four items. Example items are "Being a parent is harder than I thought it would be;" and "I often feel tired, worn out, or exhausted from raising a family." Cronbach's α =.66. Inter-item correlation coefficients ranged from .28 to .42.

Perceived Maternal Autonomy Support

We used three items that reflect children's perceptions of maternal autonomy support that were created by the Fragile Family and Child Wellbeing Study research team internally to develop an indicator of perceived maternal autonomy support. These items were selected to capture children's sense of volition and being respected by their parents. The three items were "Your mom talks over important decisions with you," (1 = *never*; 4 = *always*); "Your mom listens to your side of an argument," (1 = *never*; 4 = *always*); and "How well you and your mom share ideas or talk about things that matter?" (1 = *not very well*), 4 = *extremely well*). The inter-item correlations were (rs = .20 - .24). A composite score was created by averaging the three items which was included as a single observed (manifest) variable.

Child Outcomes

Social Competences

At T3 (when target children were 9 years old) Teachers were asked to rate 30 items of students' classroom behavior and social competences on a 4-point scale (1 = *never* to 4 = *very often*). The items used in the Fragile Families and Child Wellbeing study were based on an early version of the Social Skills Rating System (SSRS; Gresham & Elliot, 1990). Because substantial revisions to the SSRS have been made over time (Gresham et al., 2018), and because the items had not been previously validated with an urban low-income diverse sample we first

conducted an exploratory factor analysis of the items using *M*plus with the default goemin rotation. Results showed that the three-factor model fit the best theoretically and statistically, X^2 (348) = 4358.824, p <.001; RMSEA =.072, CFI =.935, SRMR =.023. The three factors yielded were (see Table 2): (1) prosocial behaviors, (2) competence in dealing with peer relationships through impulsive control and problem solving, and (3) the ability to follow instructions and get work done. Examples of prosocial behaviors include "child cooperates with peers without prompting," and "Child comforts or helps other children." Examples to illustrate children's competencies in handling peer relationships are "Child controls temper in conflict with peers," and "child responds appropriately when pushed or hit by children." Examples to demonstrate children's ability to follow instructions and get work done include "Child finishes class assignments with time limits," and "Child follows your directions." The latent construct of social competences was created with three factors: child's ability to follow instructions (λ = 1.012, *SE* = .015, p < .001; inter-item reliability Cronbach's α=.950), child's ability to deal with peer relationships (λ = .664, *SE* = .023, p < .001; inter-item reliability Cronbach's α=.946), and child's prosocial behaviors (λ = .752, *SE* = .015, p < .001; inter-item reliability Cronbach's α=.955). The inter-factor correlation ranges were .74 - .85.

<Table 2 about here>

Academic Skills

Teachers reported three academic skills: child's language and literacy skills, child's science and social studies skills, and child's math skills on a five-point scale (1 = far below average to 5 = far above average). A latent construct was created with three factors: language skills (λ = .890, *SE* = .007, p < .001), science and social studies (λ = .893, *SE* = .007, p < .001), and math skills (λ = .858, *SE* = .008, p < .001). The inter-factor correlation ranges were .76 - .80.

Persistence

The scale of persistence was comprised of four constructs. These four constructs included one self-report measure by children and observer ratings of child persistence during three observational tasks. The first construct was self-reported by children on a 5-item Task Completion and Behavior Scale, which was modeled after the perseverance scale from the PSID-CDS-II and III (Furstenberg et al., 1999). Children responded to five questions on a four-point scale, from 1 (*never*) to 4 (*always*). Example items are: "I stay with a task until I solve it"; "When I start something, I follow it through to the end". A composite score was created by averaging the five items. The inter-

item correlation coefficients ranges were .12-.40, and Cronbach's α = .60, which is acceptable especially with only five items (Hair et al., 2010)

The Peabody Picture Vocabulary Test (PPVT-III; Dunn, 1997) was used to evaluate children's receptive vocabulary by asking the participants to identify the picture of a certain word. Observers reported the level of the persistence of the child completing the PPVT by scoring each child on a five-point scale, from 1 (*consistently lacked persistence*) to 5 (*consistently persistent*).

The Digit Span Test (WISC IV Digit Span; Wechsler, 2003), for which interviewers asked children to repeat a series of numbers forward or backward and children were evaluated on the accuracy of the response. Again, observers reported the level of the persistence of child completing the Digit Span Test by scoring each child on a five-point scale, from 1 (*consistently lacked persistence*) to 5 (*consistently persistent*).

Woodcock Johnson (Shrank et al., 2014) was used to evaluate children's passage comprehension, analysis, and math-problem solving skills. Like the previous tasks, observers reported the level of the persistence of child completing the Woodcock Johnson Test by scoring each child on a five-point scale, from 1 (*consistently lacked persistence*) to 5 (*consistently persistent*).

A latent construct of persistence was created with four factors: self-report persistence (λ = .237, *SE* = .027, $p < .001$), persistence observed in PPVT (λ = .856, *SE* = .032, $p < .001$), persistence observed in the digit span task (λ = .725, *SE* = .025, $p < .001$), and persistence observed in Woodcock Johnson (λ = .879, *SE* = .029, $p < .001$). The inter-factor correlation ranges were .14 - .64.

Analysis and Results

Preliminary analysis began with an evaluation of means, standard deviations, and correlations of study variables (presented in Table 3). Missingness on items ranged from 0% to 7.25%. Missing data were handled through maximum likelihood estimate (Enders, 2011; Muthén & Muthén, 2010) using *M*plus. The overall SEM measurement model fit the data well, RMSEA =.036, CFI =.986, SRMR =.032. Measurement models for each individual latent construct were also identified or fit the data well: (1) social skills latent construct (RMSEA =.000, CFI =1.000, SRMR =.000); (2) academic skills latent construct (RMSEA =.000, CFI =1.000, SRMR =.000); (3) persistence latent construct (RMSEA =.038, CFI =.995, SRMR =.012).

<Table 3 is about here>

Subsequently, to evaluate our proposed hypotheses, we used *M*plus maximum likelihood estimation with robust standard errors (MLR) within a structural equation modeling framework to produce parameter estimates and handle missing values (Enders, 2011). We tested the associations among main constructs in one structural equation model (Figure 2). We employed multiple model fit indices to evaluate the fitness of our model: the root mean square of approximation (RMSEA), the comparative fit index (CFI), and the standard root mean squared residual (SRMR). Cutoff points of model fit indicators as described by Hu and Bentler (1999) were used to assess the fitness of our model (RMSEA < .05, CFI > .90, and SRMR < .08). In the results below, we also report the Chi-square of the model, however, because this statistic is particularly sensitive to large sample sizes, we did not expect it to meet the recommended cutoff of >.05 (e.g. non-significant; Iacobucci, 2010).

<Figure 2 is about here>

Results revealed that our model fit the data well (RMSEA = .037, CFI = .979, SRMR = .039, X^2 (81) = 333.754, p <.001). Though not all of our hypotheses were fully supported. Our first hypothesis was fully supported as perceived maternal autonomy support (T3) was directly and positively associated with all three child outcomes (T3). Our second hypothesis was partially supported as maternal parenting stress (T2) was directly and negatively associated with children's persistence, but was not directly statically associated with either social competences nor academic skills. Our third hypothesis was also partially supported with maternal education (T1) positively related to perceived maternal autonomy support (T3), but not statistically related to maternal parenting stress (T2); in addition, mother's household income (T1) was negatively associated with maternal parenting stress (T2) but unrelated to perceived maternal autonomy support (T3). Our fourth hypothesis was partially supported with maternal education (T3) positively associated with children's academic skills (T3) but unrelated to children's social competences and persistence; mother's household income (T3) was positively associated with all three children's outcomes (T3).

To test hypotheses five and six we subsequently calculated the indirect effects using bias-corrected bootstrap with 1,000 bootstrap draws method in *M*plus (Efron & Tibshirani, 1993). Our fifth hypothesis was fully supported as perceived maternal autonomy support (T3) mediated the associations between maternal parenting stress (T2) on children's social competences (T3) (β = -.004, *SE* = .002, p = .033), children's academic skills (T3) (β = -.005, *SE* = .002, p = .020), and children's persistence (T3) (β = -.007, *SE* = .003, p = .026). Finally, our sixth hypothesis was partially supported as maternal parenting stress (T2) was found to mediate the association between mother's household income (T1) and perceived maternal autonomy support (T3) (β = .006, *SE* = .003, p = .029), but

maternal parenting stress (T2) did not mediate the association between maternal education (T1) and perceived maternal autonomy support (T3).

Discussion

Using the Fragile Families and Child Wellbeing Study data, we tested six hypotheses regarding socioeconomic status, maternal parenting stress, perceived autonomy supportive parenting, and children's social competences, academic skills, and persistence. Structural equation modeling tests provided support for all of our hypotheses either fully or partially. This investigation helps to shed important light on the ways in which these factors may have both concurrent and prospective associations with one another.

First, this investigation provides additional evidence for the hypotheses made by self-determination theorists that autonomy, as one of the most fundamental human needs, facilitates children's exploration and adaptation to the society in which they are raised. In this study, children who perceived their mothers as more autonomy supportive, were also reported by themselves, their teachers, and third-party observers as more socially competent, more academically skilled, and persistent in the completion of structured tasks (as predicted in H1). Parents who talk about important decisions with their children, listen to their children's side of an argument or disagreement, and share ideas and talk about things that matter to their children and themselves demonstrate that they value children's sense of volition and agency (Ryan & Deci, 2000). Such support from parents might promote children's closeness to their families. When children feel valued as an important part of the family and that their opinions and thoughts are respected, their intrinsic motivation to do well in school may be stimulated (Pedersen, 2017; Ryan & Deci, 2000). Respect for such independent achievement may also promote children's likelihood of working to overcome obstacles or challenges and carry on until they achieve their independent goals (Ryan & Deci, 2000). Feeling encouraged by mothers or other parenting figures likely also empowers children to perform in accordance with socially desired behaviors (Deci et al., 1994; Ispa et al., 2015; Ryan & Deci, 2000; Van Petegem et al., 2017) in social interactions with peers and their teachers. The benefits of parental autonomy support, reported by parents or perceived by children are evident in middle-class families (Bernier et al., 2010; Brenning et al., 2015; Cheung & Pomerantz, 2011; Grolnick & Ryan, 1989; Keller et al., 2007; Lekes et al., 2010; Matte-Gagné & Bernier, 2011; Wang et al., 2007). The current study elaborated the advantages of autonomy supportive parenting in economically disadvantageous families as well. In accordance with previous research, these findings suggest the benefits of support and intervention that target teaching parents to be autonomy supportive early in children's lives,

which could promote their children's academic achievement, enhance their positive relationships with peers, and improve their tendency to follow teachers' instructions (Matte-Gagné et al., 2013).

Though perceived autonomy support appears to be beneficial throughout childhood it is not always consistently present in families, particularly among mother's whom experience stressful events (Matte-Gagné et al., 2013). The current study findings confirmed this important role of stress on autonomy-supportive parenting, but also (in line with H2- H6) revealed additional antecedents of children's positive outcomes, and perceived autonomy support, including maternal education (directly) and income (indirectly, through its association with parenting stress), which may reflect important social determinants of parenting behavior (Matte-Gagné et al., 2013). Though parenting education and intervention programs that focus on teaching parents how to be autonomy supportive or how to reduce or manage parenting stress might be highly valuable, it is important for policy makers, educators, and practitioners who work with parents to recognize the impact of socioeconomic constraints that sometimes exist beyond individual parent's control. Importantly, in this study we found no direct associations between income and perceived autonomy support. These associations were in effect mediated by parenting stress, which, in addition to a low income or lack of education may operate as potential risk factors that negatively impact children's development. Our findings indicate that social constraints might not always have a direct toll on the quality of parenting, but could undermine the level of autonomy support via the intervening mechanism of parenting stress. Our finding that income was negatively related to the level of parenting stress, is in line with both the family stress model (Conger et al., 1992; 2002) and social determinants of health framework's (Currie et al., 2012) emphasis on the role economic stressors may play in negatively impacting caregivers' mental health. Though parenting stress might not be a typical mental health symptom like depression or anxiety that are generally assessed with clinical measures (e.g., Depression Anxiety Stress Scales (DASS), Lovibond & Lovibond, 1995), parenting stress might undermine caregivers' wellbeing and mental capacity and in turn reduce their availability and sensitivity to their children's wants, needs, thoughts and feelings.

The current study also contributed to our understanding of the antecedents and benefits of perceived autonomy support at multiple levels. First, participants from the Fragile Family and Child Wellbeing study came from relatively economically disadvantageous as well as racially diverse backgrounds, rather than homogenously White middle-class families that have received the preponderance of attention in the existing literature (Arnett, 2008; Henrich et al., 2010). Second, though causations cannot be inferred in the current study, the current study's

longitudinal design across the first nine years of children's life with a national sample helps provide evidence of the time-order relationship among the study-variables and generalizability. Third, this investigation drew on data collected from multiple reporters responding to a variety of measures. For example, children's social competences and academic skills were reported by their teachers, and children's persistence was both self-reported and observed by researchers at age 9. Children also reported their perceptions of maternal autonomy support at age 9, whereas parents reported on education and income as well as parenting stress in early childhood. Compared to the sole use of self-report or parent-report scoring on children's experiences and outcomes, multiple reporters are more likely to overcome biases and errors generated by a single reporter (Schofield et al., 2016). Fourth, the current study took a holistic view in conceptualizing and operationalizing children's outcomes at age 9, with the considerations of academic and social competences, as well as the level of persistence, all of which are developmentally important competences and characteristics for future wellbeing and success (Habley et al., 2012; Tough, 2012; Walker & Henderson, 2012). The use of structural equation modeling allowed the researchers to construct a variety of skills under one latent construct for social competences, academic skills, and persistence. For example, social competences in this analysis consisted of children's ability to deal with peer conflict and problem solving, their tendency to follow teachers' instructions, as well as their prosocial behaviors.

Last but not least, the current study highlighted the importance of identifying social determinants of perceived autonomy support. These findings hold practical implications for parent education, suggesting the importance of engaging in autonomy supportive behavior., There are also policy implications on how to support parents in economically disadvantageous backgrounds to deal with social constraints, such as through direct financial support, or providing opportunities for increased education, which in turn could increase adult's competence and confidence as parents. Support should also be provided to parents of young children especially those who are in economically disadvantageous situations by giving parents the tools, social support, and parent education and knowledge of child development in order to reduce parenting stress and promote their parenting quality. Consequently, their children might more likely to perceive their parents as autonomy supportive, which could in turn enhance children's academic and social competences. We believe the longitudinal nature of our findings also provide support for recognizing how early investments in parents of infants could have long-term benefits for both generations.

Despite the strengths, practical, and policy implications of the current study, several caveats need to be addressed as well. First, though this study employed a longitudinal design across three time points during the first nine years of children's life, perceived autonomy support and children's outcomes were tested when children were age 9 concurrently. The Fragile Families and Child Wellbeing study has recently collected an age 15 wave of data, and is scheduled to collect even longer-term outcomes beginning in 2020. There is some evidence that adolescents can also benefit from parental autonomy support (Van der Giessen et al., 2014) though as youth enter the teenage years, peer relationships often play a larger role than parent-child interactions (Dishion & Tipsord, 2011; Rubin et al., 2005). Researchers in the future could consider incorporating potential peer influences and testing the effects of perceived autonomy support on youth outcomes during teen years to extend findings from this investigation.

It is also important to note potential limitations in the measures used for this analysis. Though the persistence construct was reported by multiple reporters, the other two child outcome constructs were reported by the target child's teacher only. Future research can be strengthened by including child self-report on academic skills in addition to teacher report, and by including parent and peer reports on child's social competences in addition to teacher report. Maternal parenting stress was also solely reported by mothers. It could be beneficial to investigate how parenting stress or family stress is perceived more broadly by family members (Patterson, 2002). Perceived maternal autonomy support was also measured by a single reporter-the child. Researchers in the future investigation might consider including parents' self-report autonomy support level and comparing whether the discrepancy between children's perceived maternal autonomy support and parents' self-report autonomy support links to parent-child relationship quality and child social and academic outcomes (Wu & Chao, 2005). Another important point to note related to the measures used in the study is that persistence might mediate the effect of parenting and later children's outcomes (NICHD, 2008). Future research can extend the current study by investigating the mediation effect of persistence in a longitudinal study that focus on how children's development is influenced by persistence at earlier ages.

Though the diversity of the sample utilized in this study is a strength, it is also important to know how it effects the generalizability of our findings. Research findings in the current study might not be generalized to families where mothers were not the primary caregivers. It is worth researchers' attention to investigate father lead or grandparents lead households to evaluate how family resources, parenting stress, and perceived autonomy support influence children's social, academic skills, and level of persistence within variable family contexts. Furthermore,

though racial group and child gender variations were not the focal research questions of the current study, researchers in the future might test possible differences among the associations between social determinants, parenting stress, autonomy supportive parenting, and child outcomes. This could consequently help parents, teachers, practitioners and scholars to better understand family functioning through the lens of perceived maternal autonomy support in families from various demographic backgrounds. Multi-group analyses would be particularly appropriate for evaluating variations across these demographics (Satorra, 2000).

The current study expanded our understanding of social factors that promote or hinder maternal autonomy support and ultimately contribute to children's multifaceted social competences, academic performance, and persistence, and consequently holds important practical implications. Our findings provide evidence that demonstrates potential long-term benefits should practitioners and family educators effectively encourage parents to support their children's autonomy when facing challenges or managing everyday responsibilities, and in helping parents to find effective ways to manage or reduce their experiences of parenting stressors. Though positively framed and slightly distinct in its conceptualization, our findings complement the emerging literature on "helicopter" parents who are over-involved in their children's lives in developmentally inappropriate ways (LeMoyne & Buchanan, 2011; Schiffrin & Liss, 2017). Recent research has found college students who grow up with helicopter parents often experience compromised academic achievement, driven in part by lower intrinsic motivation (Schiffrin & Liss, 2017). Helping parents find ways to support their children's autonomy could assist in reducing or counteracting potential negative impacts of "helicopter" parenting. Findings from the current study could also assist in informing policy makers when making policies that pertain to parents' access to educational opportunities. Promoting contexts in which parents are informed and empowered to enact autonomy supportive parenting of their children could have benefits for mothers, children, and their broader communities.

Author Contributions Both authors conceptualized this study and made contributions to writing the manuscript. The first author also conducted data analysis.

Compliance with Ethical Standards

Conflicts of Interest Authors of this study do not have any conflicts of interests.

Ethical Approval This study was approved by the University Institutional Review Board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Data used in this study were from the Fragile Families and Child Wellbeing Study. No additional informed consents were obtained by the authors of the current study.

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Table 1

Sample Demographics (N = 2233)

Variables	% or *M* (*SD*)
Child Gender	
Female	48.1%
Male	51.9%
Child Age at Time 3	9.25 (.34)
Mother Age at Time 3	34.49 (6.07)
Mother Race	
White non-Hispanic	32.4%
Black	49.1%
Asian	2.3%
American Indian	4.2%
Hispanic	0.1%
Other	10.1%
Mother Education (at Time 1 [T1] and Time 3 [T3])	
Less than high school	T1 30.9%: T3: 19.5%
High school graduate (or equivalent)	T1 31.9%: T3: 20.6%
Some college or technical school training	T1: 26.1% T3: 40.3%
College degree or graduate training	T1: 10.9% T3: 16.3%
Household Income (at Time 1 [T1] and Time 3 [T3])	
0-49% Federal Poverty Level	T1: 17.7% T3: 15.9%
50-99% Federal Poverty Level	T1: 16.9% T3: 18.9%
100-199% Federal Poverty Level	T1: 26.3% T3: 28.0%
200-299% Federal Poverty Level	T1: 14.7% T3: 13.9%
300% and above Federal Poverty Level	T1: 24.3% T3: 19.6%
Relationship Status (at Time 1 [T1] and Time 3 [T3])	
Married to target child's biological father	T1: 24.8% T3: 29.9%
Not in any kind of relationship	T1: 6.6% T3: 24.0%
Just friends	T1: 5.3% T3: 17.3%
Cohabiting or living together with child's biofather	T1: 35.9% T3: 9.6%
Divorced	T1: 0% T3: 6.1%
Separated	T1: 0% T3: 4.7%
Romantically involved but living apart	T1: 27.4% T3: 2.1%

Table 2

Exploratory Factor Analysis Based on Three Factors: Follow Instructions, Positive Peer Relationship, and Prosocial Behaviors

Items	**Follow Instructions**	**Positive Peer Relationship**	**Prosocial Behaviors**
1. Child attends to your instructions	.782		
2. Child finishes class assignments with time limits	.770		
3. Child follows your directions	.728		
4. Child uses time appropriately while waiting for help	.728		
5. Child puts work materials or school property away	.716		
6. Child easily makes transition from one activity to another	.716		
7. Child produces correct schoolwork	.695		
8. Child keeps desk clean and neat without being reminded	.691		
9. Child ignores peer distractions when doing class work	.689		
10. Child uses free time in an acceptable way	.621		
11. Child controls temper in conflict with peers		.778	
12. Child controls temper in conflict with adults		.737	
13. Child responds appropriately when pushed or hit by children		.718	
14. Child responds appropriately to teasing by peers		.665	
15. Child receives criticism well		.654	
16. Child compromises in conflict by changing own ideas		.609	
17. Child responds appropriately to peer pressure		.595	
18. Child respects the property rights of others		.528	
19. Child accepts peers' ideas for group activities			.520
20. Child cooperates with peers without prompting			.509
21. Child comforts or helps other children			.702
22. Child forms and maintains friendships			.690
23. Child invites others to join activities			.689
24. Child gives compliments to peers			.686
25. Child makes friends easily			.684
26. Child is sensitive to the feelings of others			.603
27. Child joins an ongoing activity or group without being told			.571
28. Child gets along with people who are different			.568
29. Child expresses own feelings/opinions/ideas without putting down others			.562
30. Child says nice things about self/others when appropriate			.532

Note. Results showed that the three-factor model fit the best theoretically and statistically, X^2 (348)= 4358.824, p <.001; RMSEA =.072, CFI =.935, SRMR =.023

Table 3.

Descriptive Statistics of Study Main Variables (*N* = 2233)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.Education (T1)	--															
2.Income (T1)	.521***	--														
3.Parenting stress (T2)	-.087***	-.106***	--													
4.Autonomy (T3)	.049*	0.016	-.070**	--												
5.Follow instruction (T3)	.154***	.186***	-.054*	.066**	--											
6.Self-control (T3)	.141***	.207***	-0.037	0.027	.742***	--										
7.Prosocial (T3)	.143***	.198***	-.054**	.057**	.761***	.852***	--									
8.Language (T3)	.248***	.241***	-.059**	.096***	.521***	.344***	.383***	--								
9.Science (T3)	.238***	.230***	-.080***	.064**	.480***	.306***	.356***	.794***	--							
10.Math (T3)	.233***	.237***	-.078***	.060**	.490***	.301***	.342***	.758***	.771***	--						
11.PPVT persistence (T3)	.078***	.078***	-.070*	.087***	.164***	.160***	.161***	.206***	.191***	.167***	--					
12.DS persistence (T3)	.048***	.054*	-.052*	.053*	.137***	.131***	.136***	.178***	.180***	.150***	.627***	--				
13.WJT persistence	.086***	.093***	-.067**	.080***	.191***	.162***	.168***	.248***	.236***	.211***	.635***	.633***	--			
14.Self-report persistence (T3)	.059*	0.037	-.067**	.229***	.170***	.142***	.141***	.143***	.138***	.123***	.182***	.142***	.205***			
15. Education (T3)	.777***	.425***	-.062**	-0.025	.093***	.083***	.088***	.212***	.207***	.191***	.054*	0.033	.048*	0.015		
16. Income (T3)	.485***	.521***	-.119***	0.012	.194***	.194***	.193***	.234***	.256***	.232***	.085***	.102***	.096***	0.02	.434***	
M	2.17	3.11	2.18	2.96	2.87	2.9	2.94	2.86	2.95	2.87	4.55	4.65	4.37	2.41	2.55	3.03
SD	0.99	1.41	0.68	0.72	0.74	0.74	0.69	1.04	0.86	1	0.84	0.7	0.87	0.48	1	1.35
Range	1 - 4	1 - 5	1 -4	1 - 4	1 - 4	1 - 4	1 - 4	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5	0 - 3	1 - 4	1 - 5

Note: Maximum likelihood was used for handling cases with missing data.

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

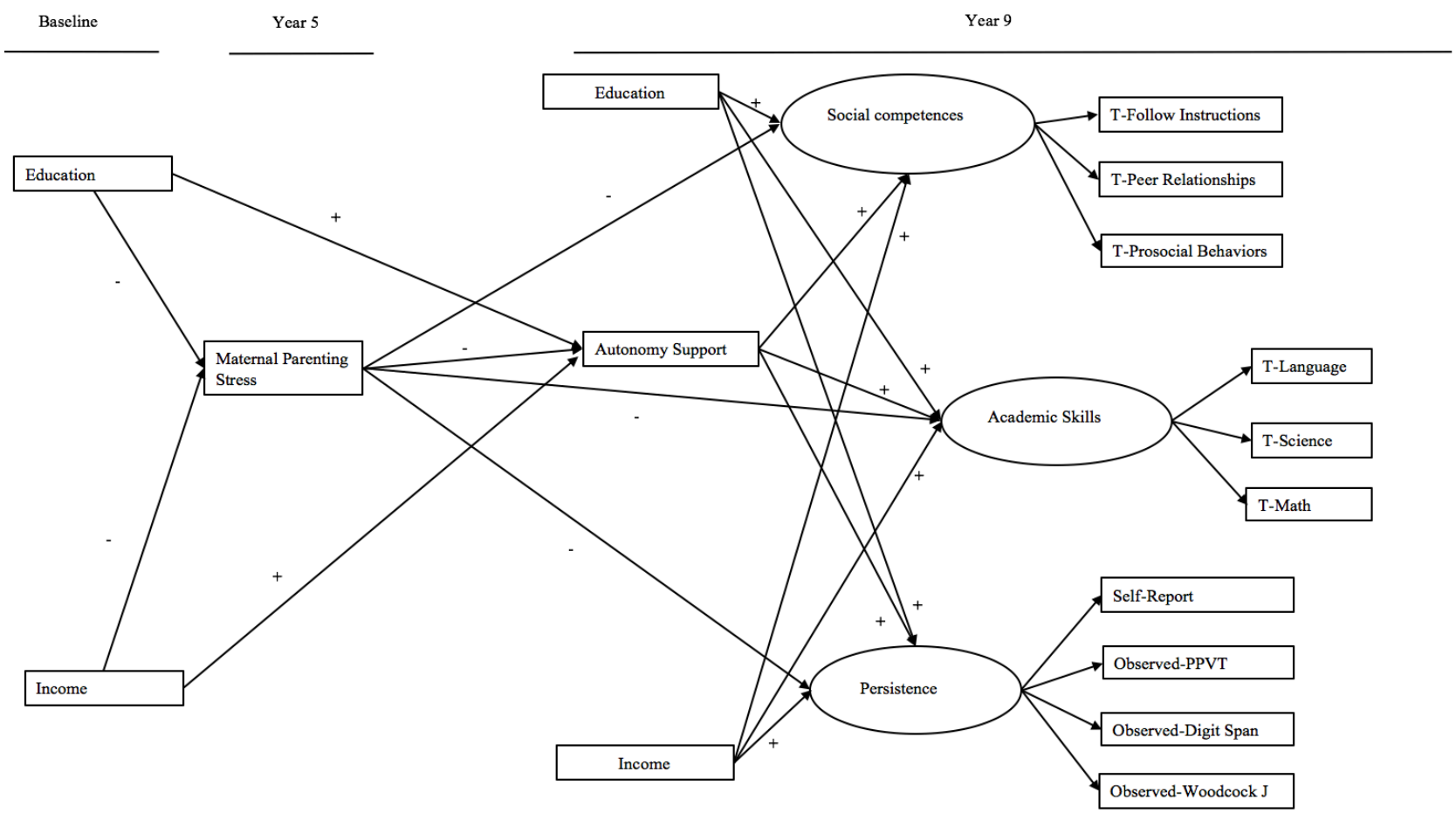

Figure 1. Conceptual Model of *P*erceived Maternal Autonomy Support and Children's Social Competencies, Academic Skills, and Persistence: Social Determinants and Mediation Effects.

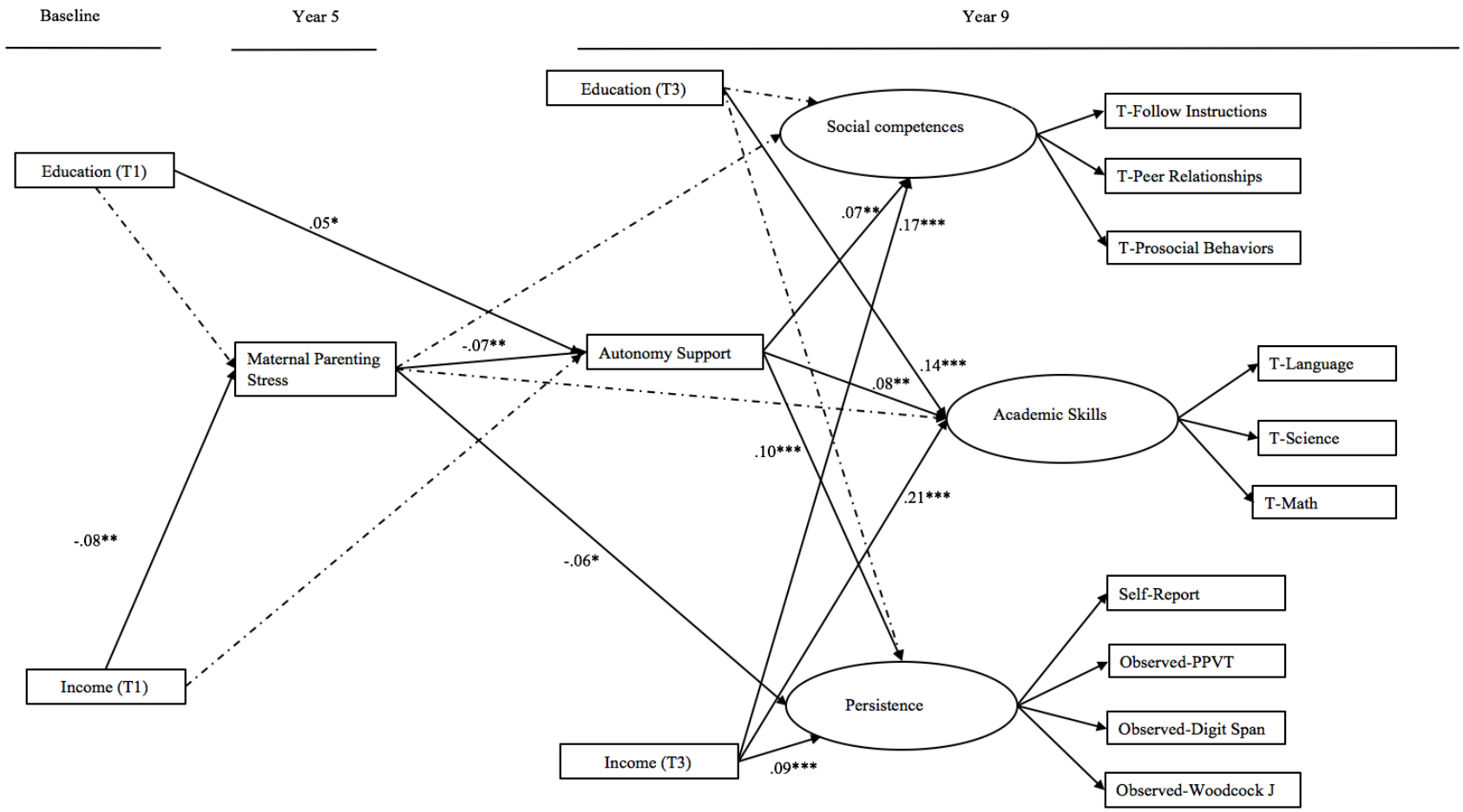

Figure 2. Perceived Maternal Autonomy Support and Children's Social Competencies, Academic Skills, and Persistence: Social Determinants and Mediation Effects. Standardized path coefficients are shown. Dashed paths display non-significant results. (RMSEA = .037, CFI = .979, SRMR = .039, X^2 (81) = 333.754, p <.001) * $p < .05$, ** $p < .01$, *** $p < .001$