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Growth Patterns of Future Orientation Among Maltreated Youth: A Prospective Examination of the Emergence of Resilience

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Abstract

During adolescence, a positive outlook toward the future (i.e., future orientation) can protect youth from the risks conferred by childhood adversity. Research to date, however, has largely considered future orientation as a static attribute. Developmental systems perspectives suggest that future orientation, when considered across time, will exhibit dynamic trajectories with levels changing in response to the varying balance of risks and resources in youths' environments. Investigating the developmental course and consequences of future orientation is particularly germane to maltreated youth who may benefit from programs that target this protective mechanism. The present study tested hypotheses regarding the developmental course of future orientation, including the association of distinct future orientation trajectories with time-varying risk factors and resources, and the association of continuity and change in future orientation trajectories with young adult psychosocial functioning. Hypotheses were investigated with longitudinal (T1 $M_{age} = 12.22$, T2 $M_{age} = 13.52$, T3 $M_{age} = 14.79$, T4 $M_{age} = 18.54$), multi-reporter data from a nationally representative sample of maltreated youth ($N = 1,461$). Growth mixture modeling (GMM) identified three classes of growth trajectories in future orientation: *high-persistent*, *low start/increasing*, and *high start/decreasing*. Time-variant and -invariant risk factors and resources differentiated youths' future orientation trajectories. Youth in the *high-persistent* and *low start/increasing* trajectories were more likely to attain young adulthood developmental milestones – including independent living skills, social capital, employment, and higher weekly income. This study documents how an important component of resilient adaptation emerges and promotes positive outcomes among highly vulnerable youth.

Keywords

Future Orientation; Resilience; Child Maltreatment; Growth Mixture Modeling; Developmental Milestones

Exposure to maltreatment in childhood confers serious risk for adverse outcomes during young adulthood, including problem behaviors (e.g., substance use and delinquency) and psychopathology (Rogosch, Oshri, & Cicchetti, 2010). Research has shown there to be considerable continuity in the adverse consequences of maltreatment as youth contend with the transition to adulthood (Hahm, Lee, Ozonoff, & Van Wert, 2010). During this transition, young people experience a myriad of developmental challenges associated with *stage-salient milestones*, such as preparing for a career, learning to live independently, and developing an adult identity (Benbenishty & Schiff, 2009; Stewart, Livingston, & Dennison, 2008). For maltreated youth, achieving these stage-salient developmental milestones in young adulthood can be undermined by the enduring psychosocial consequences of maltreatment. Indeed, studies document that during the years following high school, young adults with a history of maltreatment and child welfare involvement are uniquely vulnerable to internalizing and externalizing problems, substance abuse, and difficulties in transitioning to independent social roles (Hahm et al., 2010; Hines, Merdinger, & Wyatt, 2005; Vilhena-Churchill & Goldstein, 2014).

Despite a considerable risk for adverse outcomes, many (ranging from 20% to 50%; Dubowitz et al., 2016; Zolkoski & Bollock, 2012) maltreated young adults will “beat the odds” and avoid many of the negative consequences of child maltreatment (Collishaw et al., 2007) while also attaining desired development outcomes such as being employed (McGloin & Widom, 2001). The first generation of *resilience* research focused on documenting the factors associated with positive developmental outcomes among those exposed to adversity (Rutter, 1987; Werner, 2000) and identified important protective factors that shielded youth from risk behaviors. However, recent research on resilience suggests that variability over time in risk and protective factors is key in generating change in outcomes (Luthar, 2006; Luthar & Eisenberg, 2017). Moreover, this research suggests that the process of resilience involves a number of dynamic individual capacities that interact with risk and protective factors over time (Masten, 2014a). Among maltreated youth, positive expectations for the future, a core aspect of *future orientation*, has emerged as a central individual capacity for positive adaptation in the aftermath of early life stress (Seginer, 2008). Originally conceived as a cognitive preference for decision making focused on past, present, or future events (Nurmi, 1991), recent studies also have found that future orientation facilitates positive adaptation in the face of adversity (Cabrera, Auslander, & Polgar, 2009; Robbins & Bryan, 2004). Further, research suggests that youth with positive expectations for the future are likely to use problem-focused coping skills and to persist in pursuing life goals (Nurmi, 2005). Like the construct of optimism, future orientation has been associated with reduced levels of psychopathology and substance use, higher academic achievement, and more adaptive outcomes during the transition to adulthood among youth exposed to high-risk rearing environments (Afifi & MacMillan, 2011; Benbenishty & Schiff, 2009; Rutter, 2012). Although *future orientation* and *optimism* are similar concepts, they are not synonymous. Future orientation includes setting goals and having intentions to achieve these goals, whereas optimism refers to a personality trait in which individuals are predisposed to believe that they will receive favorable outcomes (Aspinwall, 2005).

The Process of Resilience and Future Orientation

In the child development literature, resilience is defined as a process in which positive adaptation ensues in the context of severe adversity (Cicchetti, 2013; Fergus & Zimmerman, 2005; Luthar, 2006). Informed by developmental systems theories (Masten, 2014a), resilience is also conceptualized as a dynamic process that changes over time in response to fluctuating constellations of resources and risk factors (Ungar, Ghazinour, & Richter, 2013). The concept of resilience has been further expanded by the evolutionary-developmental perspective, which suggests that individuals who were reared in extremely adverse conditions and manage to pursue positive outcomes have adapted to stress (Ellis, Bianchi, Griskevicius, & Frankenhuis, 2017; Lickliter & Honeycutt, 2013). Hence, the developing child is conceived as an active agent, both influencing and being influenced over time by contextual risks and resources (Oshri, Toppo, & Carlson, 2017). These emerging perspectives on resilience focus attention on how processes associated with positive adaptation (e.g., future orientation) may emerge, solidify, or weaken over time in response to changing contexts during development (Cicchetti, 2010; Lerner et al., 2013). In contrast, extant studies largely conceptualize and model components of positive adaptation as static. This includes studies that consider future orientation as an individual trait rather than an evolving capacity, and that make conclusions about resilience mechanisms based on protective factors that are assessed at a single time-point (Benbenishty & Schiff, 2009; Sipsma, Ickovics, Lin, & Kershaw, 2012).

The Developmental Course of Future Orientation

Informed by the need for research on future orientation as a dynamic and changing component of adaptation, the first aim of the present study was to test hypotheses regarding heterogeneity in future orientation trajectories. To date, studies that include repeated measures of future orientation among maltreated youth are virtually non-existent. Related research on adolescent cognitive development suggests that aspects of future orientation develop in a linear manner, in tandem with maturation of brain regions related to executive functioning (Steinberg et al., 2009). During adolescence, youths' capacity to envision the future and consider their opportunities and barriers develops rapidly, although this is likely to be dependent on multiple risk and protective factors. For example, the development of future orientation in adolescence might be undermined or cultivated by the family environment, as research suggests that youth who feel more connected to their families perceive the world to be safer (Crespo, Jose, Kielpikowski, & Pryor, 2013). Similarly, from a systems perspective, the individual and family are embedded in broader social contexts. More optimistic future orientation, as research shows, may be facilitated through interactions with supportive peers, school environments, and communities (Chen & Vazsonyi, 2013; Seginer, 2009). Simultaneously, adolescents develop personal agency and are more capable **of seeking** out resources (e.g., social networks and social capital) that support positive expectations and goals for the future.

Theoretically, for some youth, future orientation may be a static trait, in which their level of future orientation would not be dependent upon context. However, the potential for risks and resources to vary across time and individuals, particularly when youth strive for greater

autonomy in adolescence, is expected to lead to heterogeneity in the development of future orientation. In fact, extant research suggests that a youths' environment is detrimental to their level of future orientation (Alm & Láftman, 2016; Chen & Vazsonyi, 2013; Johnson, Pas, & Bradshaw, 2016; Lindstrom Johnson, Jones, & Cheng, 2015; Massey, Gebhardt, & Garnefski, 2008; Seginer & Vermulst, 2002). Accordingly, it is plausible that for most youth, future orientation is impacted by the changes in the environment throughout childhood and adolescence. Thus, the role of the environment in contributing to variability in the development of future orientation is an important empirical question. Such heterogeneity in developmental trajectories has been conceptualized by systems theories with the concepts of multifinality and equifinality (Cicchetti & Rogosch, 1996). Multifinality refers to the notion that heterogeneous outcomes can develop from similar processes, while equifinality refers to the notion that homogeneous consequences can eventuate from distinct processes (Cicchetti & Rogosch, 1996). Specifically, multifinality underscores the potential for youth to follow distinct developmental trajectories of future orientation despite shared experiences in their rearing environment. In contrast, equifinality is a complementary concept that describes common outcomes that are reached by diverse future orientation pathways or trajectories.

Multi-Level Risk and Resources and Future Orientation Development

Ecological perspectives on youth development suggest that risks and resources in the youths' multi-layered environment dynamically alter capacities that support resilient processes, such as future orientation (Fergus & Zimmerman, 2005; Master, 2014a). *Multi-level contexts* refers to both proximal microsystem components (e.g., those nearer to the individual such as family and peer environments) and distal macro- and exosystem components (e.g., those farther from the individual such as school or neighborhood environments). The effect of these multi-level contexts can vary across development (e.g., childhood versus adolescence; Darling, 2007). During adolescence, the rapid development of autonomy and maturation of the self-concept affects interactions with peers and family members, as well as interactions in school and community contexts (Eamon & Mulder, 2005). Relatedly, among adolescents exposed to adverse rearing environments, self-esteem is an important individual asset that can promote a positive transition to young adulthood by offsetting the risk for psychopathology and substance use (Oshri, Carlson, Kwon, Zeichner, & Wickrama, 2017).

Risks and resources from multiple levels can interact and result in a compounded effect on the developmental course of future orientation (Betancourt & Khan, 2008; Masten & Obradovic, 2008; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). For example, research shows that although less time is spent with the family during adolescence, harsh versus nurturing family environments continue to affect development both directly and indirectly (e.g., by affecting the selection of peers and academic orientation). Depending on the quality of these environments, youth may have reduced or increased opportunities for risky behaviors and exposure to dangerous events. Additionally, integration with a supportive peer group predicts lower levels of problem behaviors such as substance use and delinquency over the course of adolescence (Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Helsen, Vollebergh, & Meeus, 2000). Conversely, an absence of supportive friendships negatively affects school engagement as well as involvement in prosocial activities that support positive expectations for the future (Van Ryzin, 2011).

With greater autonomy in adolescence, youth are increasingly exposed to more distal levels of risk and protective factors across school and community contexts. Youth who are engaged in school activities exhibit greater academic achievement, a more positive outlook for the future, and reduced problem behaviors than those who feel disengaged or alienated from school (Dawes & Larson, 2011). Further, unsafe neighborhoods have been shown to serve as a major risk factor among maltreated youth (Manly, Lynch, Oshri, Herzog, & Wortel, 2013). Thus, the present study investigated the association between multi-level risks and resources (i.e., self-esteem, satisfaction with peers, family discipline, school engagement, social capital, and neighborhood safety) and the developmental course of future orientation. We hypothesized that maltreated youths' future orientation trajectories would demonstrate considerable heterogeneity, converging and diverging in response to the dynamic balance between resource and risk factors.

Future Orientation and Adjustment in Young Adulthood

The second aim of this study was to investigate the predictive validity of different future orientation trajectories in adolescence by relating them to a range of adaptive and maladaptive outcomes in young adulthood. As youth transition out of adolescence, young adults are tasked with the need to develop independent living skills, garner social connections, and begin forming an occupational identity. Extant research suggests that young adults who have positive expectations for the future are more likely to achieve such stage-salient developmental milestones, and avoid developing psychopathology and engaging in risky behaviors, as compared to youth with less positive expectations. This protective attribute of future orientation for at-risk youth has been well documented in the literature (Chen & Vazsonyi, 2013; Nurmi, 2005; Robbins & Bryan, 2004; Stoddard, Zimmerman, & Bauermeister, 2011; Wyman, Cowen, Work, & Kerley, 1993). However, the developmental course of future orientation in relation to young adult outcomes has not been investigated. In the present study, we predicted that youth who reported high levels of future orientation across time would exhibit enhanced positive outcomes, while youth with uniformly low levels of future orientation across time would exhibit more maladaptive outcomes.

We also expected nuanced associations between the development of future orientation and attendant adjustment outcomes in young adulthood. It is plausible that youth who hold lower expectations for the future when they are children, but have increasingly positive expectations as they mature, realize unique benefits. Such trajectories may represent a *steeling* effect (Rutter, 2012). Steeling is a process whereby exposure to adversity is hypothesized to induce strengths or an inoculation effect in the individual over time (Crofton, Zhang, & Green, 2015). Recent evolutionary developmental models (Ellis et al., 2017; Lickliter & Honeycutt, 2013) suggest that the steeling process represents a functional adaptation to stress over the life course. A less optimistic future orientation in early adolescence may represent a realistic understanding of one's environment. However, youth may re-define their outlook during adolescence, due partly to the balance of risks and resources in one's environment. The process of change of future orientation in response to proximal realities may reflect a pragmatic adaptation that facilitates the acquisition of practical living and survival skills. Alternatively, children who hold positive expectations

despite a history of maltreatment, and then experience a declining outlook, may be at a heightened risk. Increasing exposure to environmental risks and a lack of contextual resources may promote a sense of hopelessness and increase vulnerability to maladaptive outcomes, particularly for adolescents with unrealistically high expectations. Accordingly, it is possible that failure in attaining high expectations would more negatively impact youth with higher expectations than youth with lower expectations.

Previous longitudinal research has shown that some groups of at-risk youth experience positive changes in adaptation in the transition to adulthood (Masten et al., 2004). In the life course and resilience literature, changes in adaptation that significantly alter the life course have been termed *turning points* (Masten et al., 2004, Rutter, 1996). In the present sample, it is possible that increased future orientation during the transition to young adulthood and the related adaptive developmental outcomes are indicative of turning points for some late-blooming adolescents. However, given the lack of current data on the developmental course of future orientation, the potential for diverging courses to have unique influences on young adult outcomes is largely speculative. Thus, this investigation may inform a more nuanced view of how future orientation emerges among maltreated youth and contributes to later adjustment in young adulthood.

The Present Study

The current study investigated the developmental course of future orientation among maltreated youth. This included (1) modeling the developmental growth patterns of future orientation, (2) linking identified trajectories with time-varying risk and protective factors, and (3) examining the association between future orientation trajectories and young adult outcomes, including (a) psychopathology, (b) risk behaviors, (c) employment, income, and independent life skills, and (d) social capital. First, it was hypothesized that youth would exhibit diverse trajectories of future orientation during adolescence. Second, it was hypothesized that future orientation trajectories would exhibit stability, escalation, and decline in response to youths' exposure to contextual risks and resources. Lastly, it was hypothesized that future orientation trajectories characterized by consistently high expectations or increasing expectations over time would be associated with enhanced outcomes in multiple domains during young adulthood.

Given that the present study focused on maltreated youth, several predictor variables were considered in the analyses. First, multi-level predictors (reviewed above) were considered as time-varying covariates in order to account for potential change in these predictors over time. In addition, among maltreated youth, the number of types of maltreatment experiences is a robust correlate of negative outcomes (Kim & Cicchetti, 2010) and may affect the development of future orientation. For these young people, exposure to risk and resource factors may also be affected by entering the foster care system rather than being reunited with their biological parents (Cheng, 2010; Connell et al., 2009). Further, studies suggest that gender may influence future orientation, risk behaviors and the emergence of resilience. Compared to females, male youth make more risky decisions (Gardner & Steinberg, 2005) and participate in more risky behaviors (Reniers, Murphy, Lin, Bartolomé, & Wood, 2016). Gender differences have been observed in optimism for the future, with girls exhibiting less

hopefulness regarding career opportunities and males displaying concerns with future friendships and family life (for review see: Seginer, 2009). Finally, compared to male youth, female youth demonstrate more positive developmental outcomes when confronted with difficult rearing environments (McGloin & Widom, 2001). Thus, in addition to time-varying predictors from multiple levels of the youth's ecology, the influences of exposure to multiple forms of maltreatment, participation in the foster care system, and gender were considered in our modeling approach

Methods

Participants

Data for the present study were obtained from the National Survey of Child and Adolescent Well-Being (NSCAW-I), a nationally representative longitudinal study of 5,501 families who were investigated for child maltreatment between October 1999 and December 2000. Data were collected from 92 child welfare agencies in 36 states (Dowd et al., 2007). In NSCAW, children aged 10 or older ($n = 1,461$) at baseline provided information on their future orientation at each data collection time point. Children under age 10 were deemed too young to complete the future orientation questions. Thus, the analytic sample includes all children age 10 or older at baseline. Compared to the rest of the sample, the analytic subsample ($n = 1,461$) was not significantly different on child racial minority status, family income, or number of maltreatment subtypes reported by the caseworker. The subsample used in the present analyses **was** significantly more likely to be female than excluded cases.

The first three time points of data collection were 18 months apart, and data collection at the last time point ranged from 36–60 months after Time 3. Of the study sample, 56.26% were female, and youth mean ages were 12.22 ($SD=1.58$) at baseline (T1), 13.52 ($SD=1.60$) at Time 2 (T2), 14.79 ($SD=1.59$) at Time 3 (T3), and 18.54 ($SD= 1.29$) at Time 4 (T4). The study sample was racially diverse (52.50% Caucasian, 31.55% African-American, 8.15% American Indian, 2.81% Asian/Hawaiian/Pacific Islander, 4.79% Other), and 16.08% of participants were identified as Hispanic. The majority of families (59%) earned less than \$25,000 annually.

Face-to-face interviews were conducted with target children and their primary caregivers. Questions about risk behaviors were administered using an audio computer assisted self-interview (ACASI) format. This format has been found to reduce underreporting bias on questions regarding sexual behavior, unlawful activity, and other sensitive items (Turner et al., 1998).

Measures

Child Protective Services records.—Caseworkers provided details on documented child maltreatment reports, which were coded by trained researchers using a modified version of the Maltreatment Classification System (Manly, Cicchetti, & Barnett, 1994). On average, caseworkers reported more than one maltreatment type for each child ($M = 1.31$, $SD = .73$). Youth were reported to have experienced maltreatment types at the following rates: physical abuse (32.7%), emotional abuse (13.8%), sexual abuse (20.2%), physical

neglect (19.5%), and supervisory neglect (34.2%). Cases were coded as 1 (*maltreatment reported*) or 0 (*maltreatment not reported*) for all maltreatment types. An aggregate variable of child maltreatment types was used to examine the effect of child maltreatment on future orientation trajectories.

Future orientation (T1–T3).—Youth self-reported their future orientation at T1–T3 using a six-item scale adapted from the Expectations About Employment, Education, and Life Span inventory (Bearman, Jones, & Udry, 1997). Youth responded to questions regarding their expectations about achieving adult milestones such as having a good job by age 30, graduating from high school, and living to be at least 35. Responses ranged from 1 (*no chance*) to 5 (*it will happen*). This measure has been used in previous studies with adolescents and predicted physical health (McDade et al., 2011) and risk behaviors (Resnick et al., 1997). The scale showed tenuous internal reliability ($\alpha_{T1} = .54$, $\alpha_{T2} = .51$, $\alpha_{T3} = .52$). Thus, prior to testing study hypotheses, we investigated the scale's factor structure using confirmatory factor analyses (CFA).

Protective multi-level predictors of future orientation trajectories (T1–T3).

Self-esteem.: Youth completed the Negative Self-Esteem Subscale of the Children's Depression Inventory (CDI; Kovacs, 1992). The five-item subscale queried youth regarding their attitudes towards themselves (e.g., "I do not like myself" and "I am not sure if things will work out for me"). Possible responses were on a three-point Likert-type scale, and included 0 (*absence of symptoms*), 1 (*mild symptoms*), and 2 (*definite symptoms*). The summed scores were coded such that higher scores indicated higher self-esteem. Internal consistencies for this measure were $\alpha_{T1} = .69$, $\alpha_{T2} = .65$, $\alpha_{T3} = .64$.

School engagement.: Youth reported on their school engagement by responding to 11 items adapted by NSCAW researchers from the Drug-Free School Community Act Outcome Study Questionnaire (Dowd, Kinsey, Wheelless, & Suresh, 2002). Example items included: "How often do you try to do your best work in school?" and "How often do you get along with your teachers?" A total score was calculated for school engagement, with higher values indicating greater school engagement. There was good reliability for this measure for every wave ($\alpha_{T1} = .75$, $\alpha_{T2} = .76$, $\alpha_{T3} = .77$). Children who were home-schooled ($n = 49$; 3%) were not administered this questionnaire.

Protective factors index.: To test the cumulative effect of protective factors, an index was created. Self-esteem and school engagement scores were standardized and then averaged.

Risky multi-level predictors of future orientation trajectories (T1–T3).

Physically abusive discipline.: Caregivers reported their use of physically abusive discipline on the Total Physical Assault subscale of the Conflict Tactics Scale-Parent-Child version (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). Caregivers responded to 13 items regarding the frequency with which they used physically abusive discipline to the target child in the last 12 months. Questions ranged in the severity of the abusive behavior. Sample items included "How many times have you spanked your child?" and "How many times have you burned or scalded your child?" Response values were on a

Likert scale from 1 (*one time*) to 6 (*more than 20 times*). The CTSPC has been used extensively in studies of child physical abuse (Straus et al., 1998). Internal reliabilities for this measure at three time points were $\alpha_{T1} = .69$, $\alpha_{T2} = .72$, and $\alpha_{T3} = .70$.

Peer relationship dissatisfaction. Youth responded to questions about their satisfaction with peer relationships on the Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher & Wheeler, 1985). The measure consisted of 16 questions about peers (e.g., “It’s hard for me to make friends at school”) that were summed to create a score with higher values indicating greater dissatisfaction with peers. Response options included 1 (*no*), 2 (*sometimes*), and 3 (*yes*). The measure had good internal reliabilities ($\alpha_{T1} = .90$, $\alpha_{T2} = .90$, $\alpha_{T3} = .91$). Construct validity of this measure has been established in prior studies (Cassidy & Asher, 1992).

Dangerous community environments. The caregiver reported on the community environment with three items reflecting the presence of assaults and muggings, delinquent or drug-involved gangs, and open drug use or dealing. Response values ranged from 1 (*not a big problem*) to 3 (*a big problem*). A sum score of the three items was created to index community problems. There was good reliability for this measure at each wave ($\alpha_{T1} = .83$, $\alpha_{T2} = .84$, $\alpha_{T3} = .83$).

Risk factors index. To test the cumulative effect of risk factors, an index was created. Physically abusive discipline, peer relationship dissatisfaction, and dangerous community environment scores were standardized and then averaged.

Outcomes (T4).

Risk behavior outcomes.

Arrests. Youth reported the number of times in their life that they had been arrested. To control for non-normality, data were winsorized (Ghosh & Vogt, 2012) by recoding outliers to values that were three standard deviations above the mean and then log-transforming these values.

Hard drug use. Lifetime hard drug use was reported by the youth, using the following question: “In your whole life, on how many days have you used hard drugs such as cocaine, crack, or heroin?” Possible responses ranged from 0 (*never*) to 6 (*20 days or more*). Due to the NSCAW data collection procedures, youth who were older than 18 at T4 did not report on this variable. In order to account for this non-response, reports of lifetime drug use at T3 were used for youth who did not report at T4. Responses were averaged for youth who reported their drug use at both T3 and T4.

Number of sexual partners. Youth self-reported the number of sexual partners they had in the past 12 months. Response values ranged from 0 (*no sexual partners*) to 4 (*10 or more sexual partners*).

Psychopathology.

Internalizing and externalizing symptoms.: Youth self-reported on internalizing and externalizing symptoms using the Adult Self-Report's (ASR) Syndrome Scales (Achenbach & Rescorla, 2003). The ASR is a widely used instrument for measuring psychopathological syndromes and symptoms, and has been used with adults aged 18 and over in both clinical and non-clinical populations (Achenbach & Rescorla, 2001). Raw scores were used for the current study, with higher values indicating more internalizing and externalizing symptoms. Reliabilities for both subscales were good (internalizing: $\alpha = .76$, externalizing: $\alpha = .70$).

Trauma symptoms.: Youth completed the Trauma Symptom Inventory (TSI) at T4 to measure trauma symptoms, including intrusive experiences and dissociation (Briere, 1995). Example items included: "How often do you have bad dreams or nightmares?" and "How often do you remember things you don't want to remember?" For the present study, t-scores for post-traumatic stress were utilized with higher values indicating more trauma symptoms. There was good reliability for the present study sample ($\alpha = .90$).

Young adulthood milestones.

Independent living skills.: Youth self-reported their independent living skills at T4 with an 11-item index developed for NCSAW. Example items included: "Do you know how to interview for a job?", "Do you know how to use a checking account?" and "Do you know how to shop for and prepare meals?" Respondents answered 1 (*yes*) or 0 (*no*). Internal consistency amongst the items was $\alpha = .70$.

Social support and capital.: To evaluate the amount of social capital youths had accumulated, the seven-item Social Support for Emancipated Youth measure was utilized, which was adapted from items on the Duke Functional Social Support Scale (Sarason, Levine, Basham, & Sarason, 1983). Interviewers asked youth to estimate the total number of supportive social ties that they had by asking questions such as: "How many different people can you count on to invite you to go out and do things?" and "How many different people can you count on to give you chances to talk about money matters like budgeting or money problems?" A mean score of social capital was derived. Internal consistency amongst the items was $\alpha = .66$.

Income.: Youth reported their average weekly work income for the past twelve months. Those who did not have a job reported no income ("0").

Employment.: Youth self-reported their employment status using two items: "Are you currently working at a full or part-time job or jobs?" and "Have you been employed in the past 12 months?" Possible responses were 1 (*yes*), and 0 (*no*). A sum score was created and was coded as follows: 0 (*not currently employed nor employed within the past 12 months*), 1 (*not employed currently but employed within the past 12 months*), and 2 (*currently employed and employed within the past 12 months*).

Time-invariant predictors (T1).—Children reported their age and gender. Caregivers reported their past year household income at baseline. Caseworkers reported the number of

maltreatment types that were in the youths' CPS records and whether youth were placed in foster care or reunified with their biological parent(s).

Analytic Plan

All analyses were conducted using Mplus version 7.4 (Muthe & Muthe, 1998–2010). Standard errors were derived with a maximum likelihood estimator (Cudeck & O'Dell, 1994). Prior to modeling future orientation trajectories, we investigated the factor structure of the future orientation scale using a CFA. Results of the CFA informed the final version of the future orientation measure. We first conducted a latent growth curve analysis to examine the mean starting levels of future orientation and mean slope in the study sample and to determine if there was evidence of subpopulation heterogeneity. Per Wickrama and colleagues (2016), a lack of significant mean growth and the presence of significant variance in the mean level of the slope is indicative of heterogeneity in growth.

Future orientation trajectories were modeled using growth mixture analysis using procedures and guidelines set forth by Wickrama and colleagues (2016). The fit of two to five trajectories of future orientation were estimated. To determine the optimal number of growth trajectories, we considered class size and multiple model fit indices that assessed for the solutions' parsimony (i.e., AIC, BIC) as well as reliability (i.e., entropy; Nylund, Asparouhov, & Muthén, 2007).

In order to investigate predictors of future orientation trajectories, we utilized Lanza and colleagues' (2013) method which permits the examination of predictors and outcomes in trajectory models without modifying the trajectory solution. Based on this procedure, the first step is to identify the optimal trajectory solution by running an unconditional growth model. The second step involves specifying a conditional growth model that maintains the optimal solution from step one while including time-varying and time-invariant predictors (also referred to as covariates in the literature). The conditional growth model specifies the associations of predictors with trajectory groups via multinomial logistic regression. Thus, the probabilities for youth assignment to each of the latent trajectories were computed without adjusting for the presence of the concurrent covariates. The third step includes the incorporation of distal outcomes. The pseudo-class method (Wang, Hendricks Brown, & Bandeen-Roche, 2005) was used to assess the associations between class membership and T4 outcomes. This method accounts for inherent class assignment uncertainty and allows for previously established class membership probabilities to be maintained with the addition of other predictors to the model (Asparouhov & Muthen, 2013). Residual covariances of the future expectation trajectories at respective time points were freed to be estimated.

Associations between future orientation trajectories and outcomes from multiple domains that were measured at the last time point were then tested. The class-specific means and strengths of associations for continuous outcomes were compared using a chi-square difference test. Outcomes that were examined included risk (i.e., arrests, drug use, sexual risk taking), psychopathology (i.e., internalizing and externalizing problems, trauma symptoms), and young adulthood milestones (i.e., independent living skills, social capital, current and past employment, total income).

National-level sampling weights were used to account for attrition, and intra-class correlations were controlled for in all analyses. The average rate of missing data of the study variables across reporters was 8.84%, 21.59%, 23.41%, and 29.53% at the first, second, third, and fourth time points, respectively. Males and younger youth were significantly more likely to have missing data. We did not find evidence that data missingness was related to other study variables, thus supporting a missing-at-random assumption (MAR; Little & Rubin, 2002). Maximum likelihood estimation with robust standard errors estimated the model, and full-information maximum likelihood (FIML) was used to estimate missing data. Previous attrition analyses of the NSCAW data suggest that the non-response is inconsequential for nearly all analyses (U.S. Department of Health and Human Services Administration for Children and Families, 2007).

Results

Bivariate correlations, means, and standard deviations among the modeled variables are presented in Table 1.

Confirmatory Factor Analyses

To confirm the factor structure of the future orientation scale among the NSCAW youth sample, a CFA was conducted. Results supported the removal of three items (“Having a child by 18”, “Getting married by 25” and “Having children and family”) as indicated by weak loadings (range: .11 to .27). The remaining items included: “Living to 35,” “Graduating high school,” and “Having a good job” (respective factor loadings: .49, .68, .87). All factor loadings were significant ($p < .001$). Model fit was just identified and showed excellent fit (Brown, 2015).

Growth Curve Analysis

Growth curve analysis was used to examine mean level change in future orientation over the three time points. We fixed the time scores to 0, 1, and 2 with each time point representing an equidistant time interval of 18 months. The data fit the model very well, $\chi^2(1) = .13, p = .72$; CFI = 1.00; TLI = 1.05; RMSEA = .00; SRMR = .01. Results showed non-significant mean slope, suggesting that for the sample as a whole there was not linear growth in future orientation ($B = .12, p = .16$). The results revealed significant variance in the intercept ($s^2 = 1.55, p < .05$) and slope ($s^2 = .68, p < .05$) of future orientation, suggesting that the nonsignificant growth finding may be a consequence of heterogeneity in future orientation trajectories.

Growth Mixture Model

Class solutions ranging from two to five groups were compared (see Table 2). Fit statistics revealed that model parsimony increased with each subsequent class. Overall, the three-through five-class solutions demonstrated good statistical properties with minor differences between them. However, four-and five-class solutions included classes that were smaller than 5%, which would be statistically unrepresentative and have limited generalizability (Muthe & Muthe, 1998–2010). Additionally, the class solutions over three contained duplicative groups, which would have confounded interpretability and theoretical parsimony

(Ram & Grimm, 2009). The three-class solution was selected as the optimal solution based on theoretical interpretability.

The resultant trajectory groups were named based on their growth patterns, utilizing key statistical attributes in the parameters of the intercept and slopes (Jung & Wickrama, 2008). The first group was named *high-persistent* ($n = 1097$, 75.99% of sample). Youth in this group reported high future orientation at baseline with little change over time. The second group, *low start/increasing* ($n = 204$, 14.16% of sample) evinced low levels of future orientation at baseline and positive change over time. The third group, *high start/decreasing* ($n = 142$, 9.85% of sample), consisted of youth who reported high future orientation at baseline with a decrease over time. Figure 1 presents a graph of the three-class solution.

Conditional Growth Mixture Model

Predictors (T1–T3).—Fixed and time-varying predictors were added to the model. Time-invariant predictors and each time-varying predictor were examined separately. Between-trajectory comparisons on predictors, and mean levels of predictors at each time point, are reported in Table 4. In addition, covariance analyses of the effect of foster care placement and number of child maltreatment types revealed no significant differences and therefore were not reported in the subsequent sections.

High start/decreasing vs. high-persistent.: The following findings presented in the left-hand column of Table 4 represent comparisons with the *high-persistent* trajectory as a reference group. Overall, the between trajectory comparisons on the time-varying individual predictors revealed three (out of fifteen) significant differences. On the cumulative factor indexes, there were two (out of three) significant differences for the protective factor index at T1 and T3, and one (out of three) significant difference for the risk factors index at T3. Specifically, at T3, youth in the *high start/decreasing* class had lower levels of self-esteem ($OR = 0.07$, $p < .05$, 95% CI [0.01, 0.90]), were more likely to experience peer alienation ($OR = 1.06$, $p < .01$, 95% CI [1.02, 1.09]), less likely to engage in school ($OR = 0.27$, $p < .05$, 95% CI [0.08, 0.85]), and showed no significant differences in terms of physical abuse and community disorganization. Youth in the *high start/decreasing* class did not differ significantly with youth in the *high-persistent* class in terms of time-invariant predictors and time-varying predictors at T1 and T2. Youth in the *high start/decreasing* class were significantly lower on the protective index at T1 ($OR = .57$, $p < .01$, 95% CI [.38, .86]) and T3 ($OR = .68$, $p < .05$, 95% CI [.48, .95]) and were significantly higher on the risk index at T3 ($OR = 1.61$, $p < .05$, 95% CI [1.04, 2.50]) compared to the *high-persistent* class.

High start/decreasing vs. low start/increasing.: The center column of Table 4 presents findings with the low start/increasing group as the reference group. Overall, the between trajectory comparisons on the time-varying individual predictors revealed eight (out of fifteen) significant differences. On the cumulative factor indexes, there was one (out of three) significant differences for the protective factors index and risk factors index at T1, respectively. Specifically, youth in the *high start/decreasing* class were more likely to be female ($OR = 1.35$, $p < .05$, 95% CI [1.07, 1.70]). At T1, youth in the *high start/decreasing* class had higher levels of self-esteem ($OR = 1.29$, $p < .01$, 95% CI [1.09, 1.52]), were less

likely to experience physical abuse ($OR = .93, p < .05, 95\% CI [.88, .99]$), were more likely to be engaged in school ($OR = 5.00, p < .05, 95\% CI [1.24, 20.24]$), and were less likely to be in a disorganized community environment ($OR = .15, p < .05, 95\% CI [.03, .74]$). At T2, youth in the *high start/decreasing* class had lower levels of self-esteem ($OR = 0.06, p < .05, 95\% CI [0.01, 0.99]$), were less likely to experience peer dissatisfaction ($OR = .95, p < .05, 95\% CI [.91, .99]$), and showed no differences in school engagement, community disorganization, and physical abuse. At T3, youth in the *high start/decreasing* class were more likely to experience peer dissatisfaction ($OR = 1.07, p < .001, 95\% CI [1.03, 1.12]$), less likely to be engaged in school ($OR = .23, p < .05, 95\% CI [.06, .99]$), and were not significantly different from the *low start/increasing* class in terms of self-esteem, community disorganization, and physical abuse. At T1, youth in the *high start/decreasing* class were significantly higher on the protective index ($OR = 1.77, p < .01, 95\% CI [1.18, 2.66]$) and significantly lower on the risk index ($OR = .40, p < .01, 95\% CI [.21, .77]$) compared to the *low start/increasing* class.

High-persistent vs. low start/increasing.: The right-hand column of Table 4 presents findings with the *low start/increasing* group as the reference group. Overall, the between trajectory comparisons on the time-varying individual predictors revealed seven (out of fifteen) significant differences. On the cumulative factor indexes, there was one (out of three) significant differences for the protective factors index and risk factors index at T1, respectively. Youth in the *high-persistent* class were more likely to be female ($OR = 1.19, p < .05, 95\% CI [1.02, 1.40]$), older ($OR = 1.86, p < .01, 95\% CI [1.18, 2.96]$) and have a higher family income ($OR = 1.10, p < .05, 95\% CI [1.01, 1.20]$) at T1. Also, at T1 they exhibited higher levels of self-esteem ($OR = 1.49, p < .001, 95\% CI [1.33, 1.66]$), experienced less physical abuse ($OR = .94, p < .001, 95\% CI [.91, .97]$), less peer dissatisfaction ($OR = .97, p < .01, 95\% CI [.95, .99]$), were less likely to be in a disorganized community ($OR = .29, p < .01, 95\% CI [.12, .71]$), and more likely to be engaged in school ($OR = 11.92, p < .001, 95\% CI [4.23, 33.54]$). At T2, youth in the *high-persistent* class had lower levels of self-esteem ($OR = .09, p < .05, 95\% CI [.01, .79]$), experienced less peer dissatisfaction ($OR = .97, p < .01, 95\% CI [.94, .99]$), and showed no significant differences in terms of school engagement, physical abuse, and community disorganization. At T3, youth in *high-persistent* class did not differ significantly with youth in the *low start/increasing* class in terms of time-varying predictors. At T1, youth in the *high-persistent* class were significantly higher on the protective index ($OR = 3.09, p < .001, 95\% CI [2.26, 4.22]$) and significantly lower on the risk index ($OR = .29, p < .001, 95\% CI [.20, .43]$) compared to the *low start/increasing* class.

Outcomes (T4).

High start/decreasing vs. high-persistent.: Table 5 presents associations between trajectory group and young adult outcomes. The left-hand column in Table 5 presents comparisons with the *high-persistent* group as reference. Overall, the trajectory comparisons on the outcomes revealed five (out of ten) significant differences. Specifically, youth in the *high start/decreasing* class had more drug use ($M = .37, p < .05$) and more internalizing problems ($M = 54.37, p < .05$). In addition, youth in *high start/decreasing* class had less social capital ($M = 3.15, p < .001$), lower income ($M = 147.04, p < .001$), and decreased

total employment ($M = .73, p < .001$). Youth in the *high start/decreasing* and *high-persistent* classes were not significantly different in the number of sexual partners and arrests, externalizing and trauma symptoms, and independent living skills.

High start/decreasing vs. low start/increasing.: The center column in Table 5 presents comparisons with the *low start/increasing* group. Overall, the between trajectory comparisons on the outcome variables revealed five (out of ten) significant differences. Specifically, youth in the *high start/decreasing* class had fewer sexual partners ($M = .09, p < .05$), fewer trauma symptoms ($M = 49.86, p < .01$), less social capital ($M = 3.15, p < .05$), lower income ($M = 147.04, p < .05$), and were less likely to report employment ($M = .73, p < .05$) at T4. Youth in the *high start/decreasing* and *low start/increasing* classes were not significantly different in drug use, arrests, internalizing and externalizing symptoms, and independent living skills.

High-persistent vs. low start/increasing.: The right-hand column in Table 5 also presents comparisons with the *low start/increasing* group. Overall, the trajectory comparisons on the outcome variables revealed six (out of ten) significant differences. Specifically, youth in the *high-persistent* class had fewer sexual partners ($M = .11, p < .01$) and less drug use ($M = .10, p < .01$). Youth in the *high-persistent* class had fewer externalizing behaviors ($M = 54.33, p < .05$), fewer trauma symptoms ($M = 50.53, p < .01$), fewer independent living skills ($M = 5.83, p < .05$), and increased employment ($M = 1.38, p < .01$) at T4. Youth in the *high-persistent* and *low start/increasing* classes were not significantly different in arrests, internalizing symptoms, social capital, and income.

Discussion

Despite the documented associations between child maltreatment and the development of young adult risk behaviors and psychopathology, many maltreated youth avoid adverse outcomes and attain stage-salient developmental milestones that support future well-being. Past studies show that future orientation is an intrapersonal asset that can substantially attenuate the adverse effects of maltreatment on youth development (Chen & Vazsonyi, 2011; McDade et al., 2011). However, the potential for future orientation to emerge in response to changing contexts, resulting in divergent developmental paths, and in relation to resilient processes, has not been investigated. The present study builds upon the literature on future orientation and resilience. Using a nationally representative longitudinal dataset of youth with documented instances of maltreatment, the present study (a) found considerable heterogeneity in the developmental course of future orientation, (b) documented changes in future orientation in response to the dynamic balance of risk factors and resources in multiple levels of youths' contexts, and (c) linked distinct future orientation trajectories to young adults' achievement of adult developmental milestones and avoidance of negative behavioral and emotional outcomes. The current study corroborates other empirical reports in suggesting the ubiquitous presence of resilience in children (Masten, 2014a; Rutter, 2007). Indeed, in the present study, a large majority of maltreated youth showed consistently high scores of future orientation despite experiencing maltreatment, thus following the process of resilience

Although we expected future orientation to develop progressively from early adolescence to young adulthood, in concert with corresponding cognitive control functions that mature in this time span (Steinberg et al., 2009), the present study failed to find population-level linear increases in future orientation. There was, however, significant variability between youth in the development of future orientation over time. Thus, a pattern-based analytical approach was used to identify patterns of future orientation over time. Our analysis revealed three trajectories of future orientation among maltreated youth. A *high-persistent* group, 76% of the sample, demonstrated high levels of future orientation across adolescence and into young adulthood. A *low start/increasing* group, 10% of the sample, demonstrated low levels of future orientation in early adolescence that increased over time and ultimately matched the level of future orientation exhibited by their *high-persistent* peers. A *high start/decreasing* group, 14% of the sample, exhibited high levels of future orientation in childhood which then diminished over time, resulting in few positive expectations for the future upon entering the young adult years. Notably, the *high-persistent* future orientation trajectory was the largest group, comprising over three-quarters of the youth in the study sample. Relative to the other groups, youth in the high-persistent group had higher levels of resources and lower levels of risk factors over time, supporting the hypothesis that resilience processes are more probable in supportive contexts. In contrast, the presence of the *high-persistent* trajectory may also suggest that future orientation is a stable trait that protects some youth from negative outcomes in young adulthood.

The identified trajectory classes provide a compelling example of the developmental systems concepts of equifinality and multifinality (Cicchetti & Rogosch, 1996). For example, in the present study, youths' expectations for the future were not predetermined based on experiences during their first ten years of life. Rather, some maltreated youth demonstrated considerable plasticity in their second decade. For example, the *low start/increasing* subgroup of youth transitioned to adolescence with little hope for the future but demonstrated systematic linear increases in their future orientation over time. In contrast, a second group entered adolescence with high future expectations that were stable over time. These two trajectories corroborate the concept of equifinality by having different levels of future orientation in early adolescence, but showing similar levels of future orientation and adjustment in late adolescence. In contrast, the concept of multifinality is relevant to the high-persistent and decreasing trajectories. Youth in these two trajectories exhibited high levels of future orientation in early adolescence, but, over time, these trajectories diverged towards late adolescence. Specifically, youth in the high-persistent trajectory retained high levels of future orientation, while youth in the decreasing trajectory exhibited a reduction of future orientation over time.

Based on evolutionary developmental and systems perspectives on resilience, we hypothesized that divergence in youths' future orientation trajectories would be reflective, in part, of an adaptation to the environment, and would be associated with the changing balance of contextual risks and resources (Ellis et al., 2017; Masten, 2014a). Specifically, we expected that growth patterns in future orientation would reflect the dynamic equilibrium of risks and resources as youth adapted to social and personal changes during adolescence (Ellis et al., 2017; Lickliter, 2008; Oshri, Tople, et al., 2017). Indeed, increases in personal or contextual resources were significantly associated with either increasing or steadily

elevated levels of future orientation. For example, youth in the *low start/increasing* trajectory had less self-esteem, experienced more physically abusive discipline and dissatisfaction in peer relationships, displayed less engagement in school, and were living in a more disorganized community environment in early adolescence compared to youth in the *high-persistent* trajectory. As these youth experienced reductions in risk factors (e.g., less exposure to harsh discipline) and increases in resources (e.g., better peer relationships and more school engagement), they exhibited growth in future orientation, eventually “catching up” to those in the *high-persistent* group. Conversely, during adolescence, the *high start/decreasing* group experienced heightened risk factors (e.g., harsh discipline, dangerous community environments) and fewer resources (e.g., less school engagement) over time, resulting in lower future orientation in young adulthood.

Our findings revealed that, in addition to changing constellations of risk and resources, gender played a role in the developmental course of future orientation. Past research suggests that a greater prevalence of sexual abuse may lead to different outcomes for girls versus boys (Molnar, Buka, & Kessler, 2001). In the present study, girls were overrepresented in the *high-persistent* and in the *high start/decreasing* trajectories whereas boys were more prevalent in the *low start/increasing* trajectory. These gender effects emerged, even when controlling for the number of maltreatment types youth experienced. Given that the *high-persistent* trajectory consisted of the largest group of youth, these results suggested that the majority of girls might have been able to retain higher levels of future orientation compared to boys. This pattern is consistent with previous research that indicates that maltreated girls compared to boys are more likely to demonstrate positive outcomes (McGloin & Widom, 2001). However, a fraction of girls exhibited elevated risk as indicated by their disproportionate representation in the *high start/decreasing* trajectory. This divergence into two extreme pathways – elevated adjustment versus maladjustment – is consistent with developmental theories on individual sensitivity to the environment, referred to as differential susceptibility (Belsky, 2005; Ellis, Boyce, Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2011). It is possible that during the adolescent years, girls are more sensitive to contextual risks and resources than boys, resulting in divergent pathways.

The transition to adulthood is a challenging life stage for maltreated youth, as they often lack the personal and social resources needed for developing independent living skills, obtaining social capital via engagement in a supportive adult network (Runyan et al., 1998; Ungar, 2011), and securing vocational opportunities (Zielinski, 2009). Although a number of studies have linked child maltreatment to psychopathology and risk behavior, the present study extended this focus by evaluating the effects of future orientation on independent living skills, employment, income, and social capital. The findings support the conceptualization of future orientation as an asset that promotes positive young adult development and deters psychopathology and risk behavior among maltreated youth. We hypothesized that trajectories with high or increasing levels of future orientation would facilitate a successful transition to young adult roles. Study findings were consistent with this hypothesis. Specifically, youth in the *high-persistent* and *low start/increasing* trajectories showed higher levels of success in attaining developmental milestones, including higher levels of independent living skills, social capital, employment, and income, compared to the *high start/decreasing trajectory*. Youth in the *low start/increasing* trajectory exhibited

positive changes that were evident in young adulthood. These results are consistent with studies that have found young adulthood to be a *turning point* for some (Masten et al., 2004; Simons, Stewart, Gordon, Conger, & Elder, 2002). Together, these findings suggest that the identified trajectories of future orientation in adolescence have predictive utility for positive outcomes and transitions to young adulthood roles.

Although our findings corroborate past research on the protective attributes of future orientation (Stoddard et al., 2011; Wyman et al., 1993), the consideration of future orientation trajectories provides a more nuanced view of resilience. Youth in the *low start/increasing* trajectory demonstrated more positive outcomes on income, social capital, and independent living skills at T4 compared to the youth in the *high-persistent* group. When compared to youth in the *low start/increasing* trajectory, youth in the *high-persistent* trajectory displayed less risky behaviors (i.e., sexual partners and drug use), less psychopathology (i.e., externalizing and trauma symptoms), and more employment, but fewer independent living skills. These results are consistent with two perspectives on the development of risk behaviors among adolescents who experience chronic early life stress. First, the *low/start increasing* trajectory may reflect a variant of a steeling effect (Rutter, 2012). Accordingly, youths' initial low expectations about the future convey a realistic understanding of the environment, which evolves into practical independent living skills in young adulthood. Alternatively, these results are consistent with research and theory informed by life course perspectives (Johnson, Crosnoe, & Elder, 2011) that document an accelerated transition to young adulthood roles among youth who experienced childhood hardship. For example, youth who grow up with fewer economic resources and in unsafe schools or neighborhoods reported older subjective ages (Johnson & Mollborn, 2009). According to this perspective, youth who were raised in adverse environments may seek to transition from their context earlier by assuming adult roles, which may involve independent life skills as well as participation in some risk behaviors (e.g., sexual risk behaviors and substance use).

Limitations

It is important to note that there are several limitations to the present study. First, the present study comprised a sample of youth involved with child welfare agencies, narrowing the generalizability of the findings to this population. However, this is the only study, to the best of our knowledge, which has conducted a longitudinal, multi-reporter, multi-level analysis of growth patterns of future orientation as a developmental mechanism of resilience while using a nationally representative sample of youth with CPS records of child maltreatment. Second, some of the measures used in the present study had low internal consistencies (e.g., self-esteem, social capital); thus, the actual magnitude of associations with these measures may have been reduced and power to detect associations diminished. Additionally, we utilized a lifetime measure of substance use and arrests, and thus the directionality of the associations between the future orientation trajectories and these outcomes is unknown. Thirdly, this study did not take into account whether these youth and their families had been engaged in high quality social and psychological services, which might affect youth development and expectations about the future. Lastly, future orientation is a multidimensional construct, and in the present study, we focused on one component: positive

expectations for the future. Although a robust predictor of adaptation in the aftermath of child maltreatment, other components of future orientation may also inform youth development.

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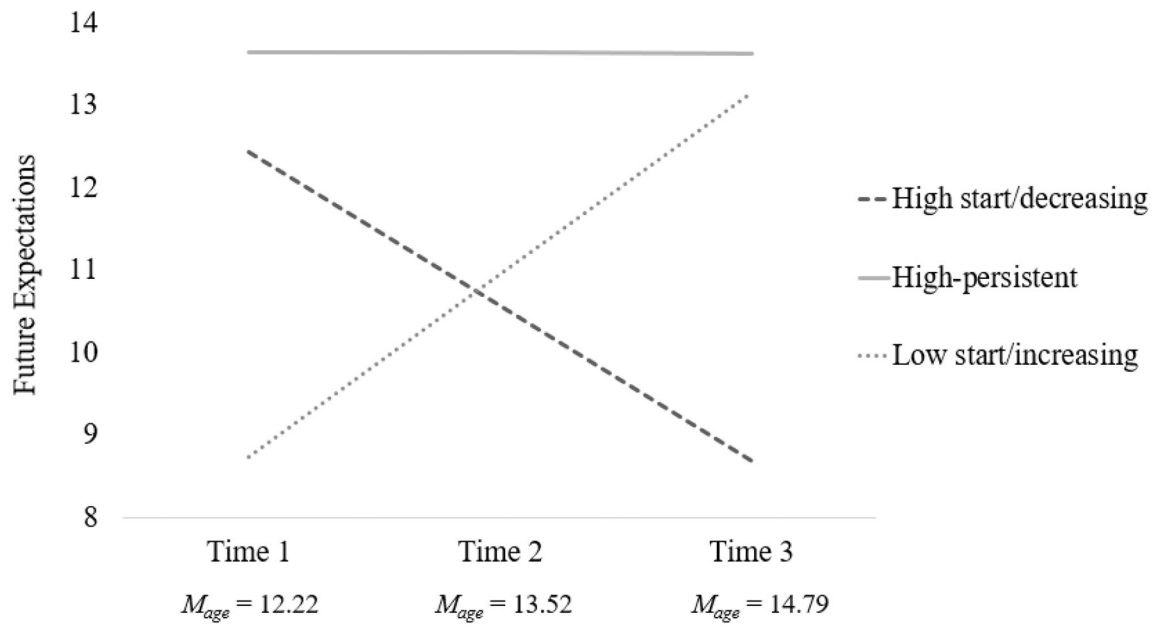


Figure 1.
Three-Class Solution of Growth Mixture Model

Table 1

Bivariate Correlations, Means, and Standard Deviations (N = 1,461)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
1. Individual FO - T1	--																																				
2. Individual FO - T2	.31***	--																																			
3. Individual FO - T3	.24***	.44***	--																																		
4. Child gender	.02	.05	.05	--																																	
5. Child age	.03	-.02	-.07**	.05*	--																																
6. SES	.01	.06	.12***	-.01	.03	--																															
7. Self-esteem - T1	.31***	.20***	.18***	-.12***	-.05*	-.67*	--																														
8. Self-esteem - T2	.13***	.29***	.18***	-.12***	-.05	-.03	.45***	--																													
9. Self-esteem - T3	.13***	.18***	.24***	-.14***	-.03	-.01	.34***	.44***	--																												
10. PA discipline - T1	-.13***	-.05	-.06	-.09***	-.11***	-.07**	-.06	-.02	-.02	--																											
11. PA discipline - T2	-.11***	-.04	.00	-.06	-.11***	-.07	-.03	-.00	-.03	.54***	--																										
12. PA discipline - T3	-.07**	-.01	-.01	-.09***	-.13***	-.05	-.04	.02	.02	.39***	.44***	--																									
13. Peers - T1	-.30***	-.21***	-.17***	.00	-.13***	-.04	-.41***	-.25***	-.21***	.09***	.05	.05	--																								
14. Peers - T2	-.20***	-.34***	-.23***	.01	-.10***	-.04	-.23***	-.32***	-.23***	.04	.01	.06	.49***	--																							
15. Peers - T3	-.16***	-.26***	-.30***	.01	-.05	-.05	-.17***	-.23***	-.34***	.08**	.01***	.07	.38***	.52***	--																						
16. School - T1	.33***	.18***	.23***	.09***	-.14***	.04	.32***	.20***	.17***	-.10***	-.02	-.02	-.37***	-.22***	-.23***	--																					
17. School - T2	.13***	.36***	.27***	.07**	-.11***	.04	.13***	.29***	.16***	-.02	-.04	-.07**	-.20***	-.39***	-.27***	.42***	--																				
18. School - T3	.15***	.20***	.36***	.12***	-.01	.07**	.13***	.19***	.26***	-.04	-.04	-.06	-.14***	-.22***	-.40***	.37***	.46***	--																			
19. Community - T1	-.04	.01	.01	-.02	.02	-.23***	.03	.03	-.02	.08**	.06	.02	.08***	.04	.04	-.04	-.03	-.04	--																		
20. Community - T2	.00	.00	.02	.04	.01	-.19***	.05	-.01	-.00	.04	.02	.01	.03	.07**	.09***	.02	-.07**	.01	.40***	--																	
21. Community - T3	-.02	-.01	-.01	-.01	-.02	-.15***	.05	.02	-.03	-.02	.04	.06	.01	.09***	.11***	.01	-.10***	-.07**	.34***	.53***	--																
22. Arrests - T4	-.01	.01	.01	-.15***	.11***	.00	.01	.04	.02	.01	.02	.05	.03	-.02	-.04	-.07**	-.07**	-.09***	.03	.03	.00	--															
23. Sex.Part. - T4	.07	-.01	-.03	.00	.18***	-.03	-.03	.00	.01	.09**	.10**	.05	-.04	-.09**	-.01	-.15***	-.02	-.14***	.07	-.05	-.06	-.06	-.19***	--													
24. Drug use - T4	-.09**	-.05	-.05	.05	.14***	.03	-.12***	-.09***	-.10***	-.02	.00	-.01	-.01	-.05	.02	-.15***	-.07**	-.14***	.07	-.04	-.03	-.04	.06	--													
25. Internalizing - T4	-.14***	-.10***	-.17***	.13***	.08**	-.02	-.20***	-.29***	-.32***	.02	-.01	.01	.17***	.22***	.30***	-.17***	-.18***	-.21***	.08**	.06	.03	.11***	.12***	.10***	--												
26. Externalizing - T4	-.09**	-.07**	-.11***	.04	.04	.03	-.13***	-.15***	-.21***	.07**	.07	.04	.13***	.18***	.22***	-.24***	-.25***	-.27***	.04	.00	.01	.18***	.21***	.10***	.10***	.08**	--										
27. Trauma - T4	-.07**	-.06	-.07	-.06	.03	-.08**	-.12***	-.14***	-.19***	.01	.03	.02	.08**	.10***	.19***	-.11***	-.12***	-.16***	.09**	.03	.04	.13***	.14***	.08**	.08**	.61***	.46***	--									
28. Ind. live skills - T4	.03	.21***	.16**	.10	.14**	.02	.07	.20***	-.02	.02	.04	.02	-.05	-.23***	-.18**	.12	.20***	.09	-.09	-.03	-.10	.25**	.18**	.15**	-.17**	-.04	-.59***	--									

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
29. Social capital - T4	.02	.11***	.12***	-.12***	-.09***	.04	.05	.14***	.12***	.00	.01	.01	-.08*	-.12***	-.15***	.06	.13***	.07	-.03	-.06	-.03	-.04	-.02	-.04	-.15***	-.05	-.03	-.03	-.03	-.03	-.03	-.03
30. Income - T4	.14***	.12***	.10*	-.09***	.16***	.11***	.02	.07	.12***	.08*	.09	.11***	-.16***	-.15***	-.11***	-.01	-.04	.04	-.07*	-.08*	-.04	.06	-.02	.01	-.09***	-.03	-.08	.67***	.07*	-.07*	-.07*	-.07*
31. Tot. employ. - T4	.18***	.18***	.18***	-.08*	.13***	.13***	.04	.06	.09*	-.02	-.01	.02	-.19***	-.15***	-.13***	.09***	.08*	.09*	-.08*	-.05	-.05	-.02	-.03	-.01	-.08*	-.08*	-.07*	.84***	.06	.58***	-.06	-.06
Mean	12.76	12.96	12.93	1.56	12.22	5.47	8.70	8.94	9.02	5.17	3.50	2.45	30.60	28.60	27.74	13.53	13.65	13.79	13.56	13.47	13.79	.18	5.77	.27	50.73	54.52	50.09	6.23	4.15	245.19	1.27	
Standard Deviation	2.29	2.13	2.23	.50	1.58	3.08	1.67	1.45	1.38	9.74	8.04	5.99	11.83	10.91	10.28	5.26	5.02	4.89	4.12	4.28	.82	9.41	1.05	11.62	10.68	8.29	2.44	3.13	215.99	0.80		

Note. T1, T2, T3, T4 = Time point 1, 2, 3, and 4, respectively. FO=Future orientation; SES = Socioeconomic status; Mal. Subtypes = Total abuse/h neglect subtypes (caseworker report); Self-esteem = Negative self-esteem; Peers = Peer alienation; PA discipline = Physically abusive discipline; Community = Disorganized community environment; Sex. Part. = Sexual partners; Internalizing, externalizing, and trauma refers to internalizing, externalizing, and trauma symptoms, respectively; Ind. live. Skills = Individual living skills; Tot. employ. = Total employment. Child gender coded as 1 = male and 2 = female. Age at the first time point ranged from 10 to 15 years old.

* $p < .05$;

** $p < .01$.

Table 2

Fit Statistics for the Growth Mixture Class Solution (N = 1,461)

Classes	AIC	BIC	Adj BIC	Entropy	M Prob.	VLMR (<i>p</i> value)	SC N (%)
1	18160.73	18182.38	18163.32	--	--	--	--
2	17770.00	17817.47	17788.88	.86	.92	.42	252 (17.49)
3	17616.61	17679.90	17641.78	.83	.95	.67	142 (9.85)
4	17450.77	17629.89	17482.24	.83	.96	.63	43 (2.98)
5	17336.80	17431.74	17374.56	.85	.96	.60	44 (3.06)

Note. AIC = Akaike information criterion; BIC = Bayesian information criteria; VLMR= Vuong-Lo-Mendell-Rubin Likelihood ratio test; SC = Smallest class size. Lower values of AIC and BIC and higher values of entropy and probabilities indicate better model fit. Chosen class is shown in bold.

Table 3

Growth Factor Parameter Estimates for Three-class Unconditional Model (N = 1,461)

<i>Trajectories</i>	<i>n (%)</i>	Intercept			Slope		
		<i>Est.</i>	<i>SE</i>	<i>95% CI</i>	<i>Est.</i>	<i>SE</i>	<i>95% CI</i>
<i>High start/decreasing</i>	142 (9.85)	12.44	1.00	[10.48, 14.40]***	-1.88	.30	[-2.47, -1.29]***
<i>High-persistent</i>	1097 (75.99)	13.65	.16	[13.34, 13.96]***	-.01	.21	[-.42, .40]
<i>Low start/increasing</i>	204 (14.16)	8.74	.31	[8.13, 9.35]***	2.21	.20	[1.82, 2.60]***

Note. Est. = Estimate; *SE* = Standard error; *CI* = Confidence interval.

p < .001.

Table 4

Multinomial Logistic Regression ORs and CIs for Predictors (N = 1,461)

Predictors	High start/decreasing vs. High-persistent			High start/decreasing vs. Low start/increasing			High-persistent vs. Low start/increasing		
	<i>M_{HD}</i> , <i>M_{HP}</i>	Logit (OR)	95% CI	<i>M_{HD}</i> , <i>M_{LI}</i>	Logit (OR)	95% CI	<i>M_{HP}</i> , <i>M_{LI}</i>	Logit (OR)	95% CI
Fixed									
Child gender	1.54, 1.60	0.12 (1.13)	[0.93, 1.38]	1.54, 1.43	0.30 (1.35)	[1.07, 1.70]*	1.60, 1.43	0.18 (1.19)	[1.02, 1.40]*
Child age	12.39, 12.11	-0.28 (0.76)	[0.41, 1.39]	12.39, 11.77	0.35 (1.42)	[0.68, 2.94]	12.11, 11.77	0.62 (1.86)	[1.18, 2.96]**
SES	4.73, 5.48	-0.08 (0.92)	[0.84, 1.02]	4.73, 4.70	0.01 (1.01)	[0.89, 1.15]	5.48, 4.70	0.09 (1.10)	[1.01, 1.20]*
Time-Varying									
<i>Protective Factors</i>									
Self-esteem – T1	8.20, 8.89	-0.15 (0.87)	[0.72, 1.04]	8.20, 7.62	0.25 (1.29)	[1.09, 1.52]**	8.89, 7.62	0.40 (1.49)	[1.33, 1.66]***
Self-esteem – T2	8.57, 8.95	-0.37 (0.69)	[0.07, 6.52]	8.57, 8.81	-2.80 (0.06)	[0.01, 0.99]*	8.95, 8.81	-2.43 (0.09)	[0.01, 0.79]*
Self-esteem – T3	8.59, 9.18	-2.61 (0.07)	[0.01, 0.90]*	8.59, 8.90	-0.84 (0.43)	[0.03, 6.76]	9.18, 8.90	1.78 (5.91)	[0.6, 58.11]
School engagement – T1	11.63, 14.83	-0.87 (0.42)	[0.11, 1.64]	11.63, 9.85	1.61 (5.00)	[1.24, 20.24]*	14.83, 9.85	2.48 (11.92)	[4.23, 33.54]***
School engagement – T2	10.86, 13.51	-0.70 (0.49)	[0.09, 2.61]	10.86, 11.67	-0.80 (0.45)	[0.07, 2.72]	13.51, 11.67	-0.09 (0.91)	[0.24, 3.44]
School engagement – T3	11.01, 13.97	-1.33 (0.27)	[0.08, 0.85]*	11.01, 12.81	-1.45 (0.23)	[0.06, 0.99]*	13.97, 12.81	-0.12 (0.88)	[0.27, 2.89]
<i>Risk Factors</i>									
Harsh PA discipline – T1	5.07, 4.23	0.00 (1.00)	[0.93, 1.06]	5.07, 10.13	-0.07 (0.93)	[0.88, 0.99]*	4.23, 10.13	-0.06 (0.94)	[0.91, 0.97]***
Harsh PA discipline – T2	4.30, 2.95	0.01 (1.01)	[0.97, 1.05]	4.30, 5.10	0.01 (1.01)	[0.96, 1.06]	2.95, 5.10	0.00 (1.00)	[0.97, 1.04]
Harsh PA discipline – T3	3.88, 2.21	0.05 (1.05)	[0.99, 1.12]	3.88, 3.61	0.04 (1.04)	[0.97, 1.11]	2.21, 3.61	-0.01 (0.99)	[0.93, 1.04]
Peer Alienation – T1	35.49, 29.68	0.03 (1.03)	[1.00, 1.06]	35.49, 36.66	0.00 (1.00)	[0.97, 1.03]	29.68, 36.66	-0.03 (0.97)	[0.95, 0.99]**
Peers Alienation – T2	30.77, 27.52	-0.02 (0.98)	[0.95, 1.02]	30.77, 33.35	-0.05 (0.95)	[0.91, 0.99]**	27.52, 33.35	-0.04 (0.97)	[0.94, 0.99]**
Peers Alienation – T3	33.44, 26.33	0.05 (1.06)	[1.02, 1.09]**	33.44, 28.56	0.07 (1.07)	[1.03, 1.12]***	26.33, 28.56	0.02 (1.02)	[0.99, 1.05]
Community Disorganization – T1	3.53, 3.85	-0.70 (0.50)	[0.10, 2.40]	3.53, 4.36	-1.93 (0.15)	[0.03, 0.74]*	3.85, 4.36	-1.23 (0.29)	[0.12, 0.71]**
Community Disorganization – T2	3.51, 3.82	-0.64 (0.53)	[0.12, 2.30]	3.51, 4.02	-0.15 (0.86)	[0.15, 5.02]	3.82, 4.02	0.48 (1.62)	[0.51, 5.14]
Community Disorganization – T3	3.65, 3.93	-0.42 (0.66)	[0.15, 2.82]	3.65, 4.35	-1.12 (0.33)	[0.06, 1.66]	3.93, 4.35	-0.70 (0.49)	[0.19, 1.26]
<i>Protective Factors Index</i>									
Protective Factor Index – T1	-0.30, 0.18	-0.56 (0.57)	[0.38, 0.86]**	-0.30, -0.67	0.57 (1.77)	[1.18, 2.66]**	0.18, -0.67	1.13 (3.09)	[2.26, 4.22]***
Protective Factor Index – T2	-0.38, 0.00	-0.06 (0.94)	[0.66, 1.33]	-0.38, -0.24	-0.24 (0.79)	[0.52, 1.20]	0.00, -0.24	-0.18 (0.84)	[0.60, 1.17]

Predictors	High start/decreasing vs. High-persistent		High start/decreasing vs. Low start/increasing		High-persistent vs. Low start/increasing	
	<i>M_{HD}</i> , <i>M_{HP}</i>	Logit (OR)	<i>M_{HD}</i> , <i>M_{LI}</i>	Logit (OR)	<i>M_{HP}</i> , <i>M_{LI}</i>	Logit (OR)
Protective Factor Index – T3	-0.39, 0.08	-0.39 (0.68)	-0.39, -0.10	-0.34 (0.71)	0.08, -0.10	0.05 (1.05)
		[0.48, 0.95] [*]		[0.49, 1.03]		[0.77, 1.42]
<i>Risk Factors Index</i>						
Risk Factor Index – T1	0.05, -0.07	0.31 (1.37)	0.05, 0.43	-0.91 (0.40)	-0.07, 0.43	-1.23 (0.29)
		[0.71, 2.65]		[0.21, 0.77] ^{**}		[0.20, 0.43] ^{***}
Risk Factor Index – T2	0.01, -0.05	-0.25 (0.78)	0.01, 0.25	-0.50 (0.61)	-0.05, 0.25	-0.25 (0.78)
		[0.45, 1.37]		[0.32, 1.14]		[0.51, 1.19]
Risk Factor Index – T3	0.15, -0.05	0.48 (1.61)	0.15, 0.19	0.45 (1.57)	-0.05, 0.19	-0.03 (0.97)
		[1.04, 2.50] [*]		[0.91, 2.70]		[0.63, 1.50]

Note. OR = Odds ratio; SE = Standard error; CI = Confidence interval; *M_{HD}* = Mean score of the high start/decreasing class; *M_{HP}* = Mean score of the high-persistent class; *M_{LI}* = Mean score of the low start/increasing class; T1, T2, T3 = Time point 1, 2, and 3, respectively; Child gender coded as 1 = male and 2 = female; SES = Socioeconomic status; PA discipline = Physically abusive discipline; Peers = Dissatisfaction in peer relationships (child report); School = School engagement; Community = Disorganized community environment.

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

Table 5

Means and χ^2 Differences for Continuous Outcomes (N = 1,461)

T4 Outcomes	Comparison trajectory vs. Reference trajectory		High start/decreasing vs. High-persistent		High start/decreasing vs. Low start/increasing		High start/increasing vs. Low start/increasing		
	High start/ decreasing Mean (SE)	High-persistent Mean (SE)	χ^2	High start/ decreasing Mean (SE)	Low start/ increasing Mean (SE)	χ^2	High-persistent Mean (SE)	Low start/ increasing Mean (SE)	χ^2
Risky Behaviors									
Sexual partners	0.09 (.08)	0.11 (.02)	0.04	0.09 (.08)	0.35 (.09)	4.47*	0.11 (.02)	0.35 (.09)	7.28**
Drug use	0.37 (.11)	0.10 (.02)	5.30*	0.37 (.11)	0.51 (.12)	0.70	0.10 (.02)	0.51 (.12)	10.85**
Arrests	0.30 (.10)	0.17 (.02)	1.14	0.30 (.10)	0.27 (.07)	0.06	0.17 (.02)	0.27 (.07)	1.62
Psychopathology									
Internalizing	54.37 (1.27)	51.21 (.39)	5.14*	54.37 (1.27)	53.47 (1.13)	0.26	51.21 (.39)	53.47 (1.13)	3.27
Externalizing	56.02 (1.27)	54.33 (.37)	1.47	56.02 (1.27)	56.81 (1.03)	0.22	54.33 (.37)	56.81 (1.03)	4.75*
Trauma symptoms	49.86 (1.28)	50.53 (.37)	0.23	49.86 (1.28)	55.04 (1.28)	8.21**	50.53 (.37)	55.04 (1.28)	10.59**
Young Adulthood Milestones									
Independent living skills	6.95 (1.29)	5.83 (.26)	0.61	6.95 (1.29)	7.08 (.45)	0.01	5.83 (.26)	7.08 (.45)	4.65*
Social capital	3.15 (.24)	4.12 (.11)	12.25***	3.15 (.24)	4.35 (.43)	5.82*	4.12 (.11)	4.35 (.43)	0.27
Income	147.04 (30.90)	267.20 (10.05)	12.68***	147.04 (30.90)	271.86 (45.78)	4.61*	267.20 (10.05)	271.86 (45.78)	0.01
Total employment	0.73 (.12)	1.38 (.03)	23.54***	0.73 (.12)	1.09 (.10)	5.22*	1.38 (.03)	1.09 (.10)	7.54**

Note. SE = Standard Deviation. Income = Average weekly income in U.S. dollars. Total employment = Employment status during the past 12 months.

* $p < .05$;

** $p < .01$;

*** $p < .001$.