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Youth Program Adult Leader's Directive Assistance and Autonomy Support and Development of Adolescents' Agency Capacity

David Hansen
University of Kansas

E. Whitney Moore
Wayne State University, whitneymoore@wayne.edu

Nadia Jessop
University of Kansas

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Wayne State University

Nadia Jessop

University of Kansas

Author Note

David M. Hansen, Educational Psychology, University of Kansas; E. Whitney Moore, Department of Kinesiology, Health & Sport Studies, Wayne State University; Nadia Jessop, Educational Psychology, University of Kansas.

Address correspondence to David M. Hansen, Educational Psychology, University of Kansas, 1122 West Campus Road, JRP 642 Lawrence, KS 66045. E-mail: dhansen1@ku.edu

Youth Program Adult Leader Supports and Development of Adolescents' Capacity for Agency

Adult life and work places a premium on adolescents who develop capacities for exercising agency—capacities to self-direct/regulate one's effort, attention, and behavior over time to achieve goals. Increasingly, well-paying jobs require achieving goals, anticipating outcomes, and overcoming obstacles to unstructured, open-ended problems (Levy & Murnane, 2013). With relatively few well-delineated pathways to adulthood in the United States (Macmillan, 2005; Mortimer, Oesterle, & Krüger, 2005; Settersten & Gannon, 2005), adolescents need capacities for exercising agency to find their own pathways (Schwartz, Zamboanga, Meca, & Ritchie, 2012). Furthermore, adolescents need capacities for exercising agency to address current and future personal life problems, the resolution of which has implications for well-being and mental health (Wehmeyer, Shogren, Little, & Lopez, 2017).

Many organized youth programs, such as leadership, arts, or civic action programs provide opportunities for adolescents to develop a capacity for exercising agency. For example, some youth programs aim to foster adolescents' skills for setting and achieving personal or group goals through work on self-selected and/or self-directed projects. Such self-directed projects include planning and running an event to address a community need (Larson & Hansen, 2005) or working on a production (Heath, 1998). These projects are thought to develop adolescents' agency related capacities for a) thinking strategically about how to accomplish work (e.g., make flexible plans with contingencies; Larson & Angus, 2011; Larson & Hansen, 2005), b) assuming responsibility for meeting expectations and obligations (e.g., personal, group, and program; Salusky et al., 2014; Wood, Larson, & Brown, 2009), and c) becoming intrinsically motivated by the work and its challenges (Larson, Hansen, & Walker, 2005; Pearce & Larson, 2006).

Youth program leaders play a key role in assisting adolescents in the process of building capacities for agency. Larson and colleagues proposed that two types of adult supports contribute to the development of adolescents' capacity for agency (Larson & Angus, 2011; Larson & Hansen, 2005; Larson, Lampkins-Uthando, & Armstrong, 2014). First, adult leaders can provide directive assistance (e.g., establishing work norms, setting deadlines and benchmarks) to help adolescents structure, control, and steer their own work. Second, adult leaders can provide autonomy support to ensure that youth retain control (e.g., decision-making) over the work. The purpose of this study was to evaluate the relations of youth program leader's directive assistance and autonomy support on adolescents' capacity for exercising agency.

Agency Development

Although there are numerous nuanced definitions of human agency within psychology, most focus on individuals' sense of empowerment and belief in their ability to achieve a desired goal or outcome (e.g., Wehmeyer et al., 2017). A core tenant of human agency theory is that individuals seek to engage in self-determined, agentic actions—to exercise volition and control over their actions (Bandura, 2006; Ryan & Deci, 2000). Thus, agentic individuals "are able to decide for themselves which options are 'right' for them, to sort through these options largely on their own, to 'change course' when their original plans are blocked, and to follow their efforts through to completion" (Schwartz, Donnellan, Ravert, Luyckx, & Zamboanga, 2012, p. 341). One's sense of agency emerges from repeated experiences of engaging in self-directed actions, that is, it emerges from exercising agency (Little, Hawley, Henrich, & Marsland, 2002). The preponderance of research on human agency concerns agency-related beliefs or attitudes rather than specific capacities or skills needed for achieving a desired goal or outcome. A focus on

capacities for exercising agency is needed to understand how we might create intentional opportunities and conditions for adolescents to develop their capacity for agency.

Some scholars argue that adolescence offers an enhanced opportunity to develop capacities for agency because of the concomitant rapid expansion and integration of cognitive (e.g., metacognitive) and affective (e.g., motivational) regulatory capacities (Hansen & Jessop, 2017; Larson & Angus, 2011). With the advent of puberty, adolescents experience an extended period of rapid brain development for the apparent ontogenetic aim of building capacities for the conscious self-regulation and coordination of cognition, affect, and behavior (Keating, 2004; Luna & Sweeney, 2004). Adult life and work in contemporary society increasingly demands these agency-related capacities (Larson, 2000). Developing a capacity for agency, however, is not a foregone conclusion of neurological maturation; it requires volitional engagement in activities that demand the exercise of agency-related capacities. Thus, without specific experiences that promote the development of adolescents' capacity for agency, this capacity is less likely to flourish (Hansen & Jessop, 2017).

Youth Programs as a Setting for Learning Capacities for Exercising Agency

Youth programs can provide adolescents with opportunities to develop a capacity for agency (Eccles & Gootman, 2002; Heath, 1998; Mahoney, Larson, Eccles, & Lord, 2005). Leadership and arts programs in particular are thought to provide foundational conditions for learning capacities for exercising agency (Larson & Angus, 2011). For example, the National Future Farmers of America (FFA), a salient youth program in rural communities, has made adolescent participants' development of capacities for exercising agency a major focus. FFA participants can choose projects they want to work on, or create and implement their own projects (Larson & Hansen, 2005; Larson et al., 2005). A key feature of such projects is that they

typically occur over extended periods (e.g., weeks or months), and thus push adolescents to extend their reasoning and planning further into the future. Such experiences contribute to developing the adolescents' anticipatory or 'prospective' thinking capacities (Heath, 1998; Larson, Lampkins-Uthando, et al., 2014).

Voluntary work on projects in youth programs can also provide opportunities for adolescents to interact with complex human systems (e.g., businesses) that have their own dynamics and rules of operation (e.g., Catch 22's; Larson & Hansen, 2005). Larson and colleagues propose that such interactions promote development of adolescents' strategic thinking capacities; for example, developing flexible heuristics (versus inflexible plans), creating schemes for how others' perspectives and motives affect plans, and engaging in pragmatic means-ends reasoning about achieving goals (Larson, 2007; Larson & Hansen, 2005; Larson, Lampkins-Uthando, et al., 2014).

Youth programs can also provide opportunities for adolescents to develop higher-order motivational capacities related to agency. Adolescents' voluntary work on projects in youth programs, particularly projects they initiate and self-direct, can heighten a sense of ownership and responsibility, which helps sustain adolescents' engagement in a project and see it through to completion (Salusky et al., 2014; Wood et al., 2009). Scholars suggest this sustained volitional engagement promotes the development of higher-order motivational capacities, including a capacity to derive enjoyment and motivation from surmounting the challenges of the work (Blumenfeld, Kempler, & Krajcik, 2006; Heath, 1999; Moore & Hansen, 2012; Pearce & Larson, 2006).

Adult Leader's Supports and Adolescents' Agency Development

Adult youth program leaders can play an instrumental role in supporting the development of adolescents' capacity for agency (Halpern, 2005; Kirshner, 2008; Larson & Angus, 2011). (Peer relationships can also play an important role in the learning process, but this dimension was beyond the scope and data of this study). Larson and Angus (2010) proposed two types of supports adult program leaders can provide that contribute to adolescents' developing a capacity for exercising agency. *First*, adult youth program leaders can provide 'directive assistance' by creating and maintaining appropriate structures that connect project activities to the program's culture, traditions, and norms (Halpern, 2005; Kirshner, 2008; Larson & Angus, 2011). Directive assistance is thought to promote adolescents' capacity for agency by giving them access to work expectations (e.g., deadlines, accountability) and specific tasks required to accomplish their work (Durlak & Weissberg, 2007; Pearce & Larson, 2006). Over time a "culture of accountability" within a program can promote adolescents' internalization of a sense of personal responsibility for the outcomes of their work (Larson, Griffith, et al., 2014; Wood et al., 2009). Larson and Angus (2011) further proposed that directive assistance promotes adolescents' development of motivation-related capacities for exercising agency. That is, adolescents learn they can mobilize (i.e., regulate) their effort and purposively engage in the challenges of the work, which helps them see a project through to completion and receive "confirmatory feedback" that they are capable of meeting a priori demands of the project.

Second, adult youth program leaders can provide facilitative assistance through intentionally promoting adolescents' autonomy and control over their own work (Larson & Angus, 2011; Larson & Hansen, 2005). Although Larson and Angus (2011) use the term facilitative assistance, we use the term autonomy support here since support for autonomy was integral to their conceptualization and it reflects the current study's operationalization. Larson

and Angus (Larson & Angus, 2011) proposed that autonomy support promotes adolescents'

learning capacities for thinking strategically about how to accomplish work, including complex

means-end, pragmatic, and anticipatory reasoning, as well as contingency planning and task

prioritization (Larson & Hansen, 2005). A rich research literature from self-determination theory

indicates that choice and autonomy over one's behavior and actions in a setting are essential for

gaining a sense of agency (Ryan & Deci, 2000). Based on the qualitative research of Larson and

colleagues, as well as self-determination theory, both autonomy support and directive assistance

should promote adolescents' developing a capacity for exercising agency. Although the literature

suggest the type of support may target different capacities, there is not yet enough research to

hypothesize specific relations.

This Study

The purpose of this study was to evaluate the hypothesized relations of adult youth

program leaders' directive assistance and autonomy support with the development of

adolescents' capacity for exercising agency over the course of two years (two measurement

occasions). We addressed two hypotheses. First, directive assistance and autonomy support by

the adult leader in a program will positively correlate with adolescent participants' capacity for

exercising agency within each measurement occasion. Second, we hypothesize that directive

assistance and autonomy support at Time 1 will positively predict adolescents' capacity for

exercising agency at Time 2. Prior research has primarily been qualitative and thus does not

suggest the relative magnitude of these relations.

Methods

Sample

The sample for this study is rural high school students participating in local Chapters of the National FFA over the course of two consecutive years. The FFA was a salient context in which to examine adolescents' development of their capacity for exercising agency. The stated mission of the FFA is to make "a positive difference in the lives of students by developing their potential for *premier leadership*, *personal growth* and *career success* through agricultural education" (emphasis added; "FFA Mission & Motto," 2017). The three precepts in FFA's mission (italicized in mission statement) emphasize many components that reflect capacities for exercising agency. FFA defines the premiere leadership component as "influence." Included within this precept is the development of capacities for Action (i.e., skills and competencies for achieving outcomes), Vision (i.e., having a clear vision of what the future should be), and Continuous Improvement (i.e., pursuit of learning and growth). Next, FFA defines the personal growth component as "the positive evolution of the whole person" (p. 7). Included within this precept is the development of capacities for Professional Growth (i.e., cultivating awareness and application of skills for career success) and Mental Growth (i.e., developing applied and effective reasoning, thinking, and coping skills). Last, FFA defines the career success component as "qualities, attributes and skills" (p. 7) for future career success and an ability to be an effective, contributing member of society. Included within this precept is the development of capacities for Decision Making (i.e., "ability to analyze a situation and execute an appropriate course of action" (p. 7)) and Flexibility/Adaptability (i.e., capacities for and will (drive) to change).

The FFA is a common youth program located in rural high schools with linkages to schools' agricultural education courses. Each Chapter has at least one adult advisor who is also the agricultural teacher during the school day. Chapters follow the National FFA curriculum and

structure, which provides a consistent emphasis across Chapters on the FFA mission. A particular Chapter can participate in a range of FFA activities, such as social and agriculture-related events, community service projects, and supervised agricultural experiences (owning and operating agriculture-related business), plus state and national activities (e.g., conventions) and events (e.g., skill competitions). FFA's strong emphasis on developing adolescents' capacities related to exercising agency provided an appropriate setting for this study.

Sampling

   Purposive sampling of FFA Chapters. Three criteria were used to select 10 FFA Chapters from an initial pool of 58 Chapters located within a two-hour drive (approximately 150 miles) of a Midwest university; the distance was necessitated by logistic and funding constraints. For the first criterion, performance data collected by the Facilitating Coordination in Agricultural Education board on a Chapter's "quality indicators" and "program standards" was used to compute a sum score for each Chapter. We included 28 performance indicators: eight for classroom instruction (e.g., teacher possesses minimum of 2,000 hours of work experience), four for FFA participants supervised agricultural experiences, and 16 for FFA activities (e.g., conducted Agricultural Expos). One point was given for each indicator met by a Chapter for a potential range of 0-28 points. Chapters with *less than* 15 points were excluded from the selection pool because we reasoned they would not provide sufficient opportunities for adolescents to engage in the FFA curriculum and thus limit the potential to develop a capacity for agency.

   Chapters were also considered for selection only if they had at least one advisor who had been teaching for three or more years in the current school. We reasoned there could be significant year-to-year change in a Chapter's involvement in the FFA curriculum for advisors

who had recently transitioned to a new school/Chapter. Finally, only Chapters with at least 40

student members were considered for selection to ensure reasonable representation of the overall

experience in a Chapter. After applying these three criteria to the initial pool, there were 16

chapters with at least 15 points. Based on a median split, we divided Chapters into two groups:

eight with a score of 20 or more points and eight with 15-19 points. This split was deemed

necessary to ensure representation of the range of programs resulting from the random selection

of Chapters. From each of these two groups of eight, we randomly selected five chapters for a

final sample of 10 Chapters.

Adolescents. The adolescent sample consisted of 441 high school students (66.2% male)

from 10 FFA Chapters. The mean age of participants at Time 1 was 16.03 (range = 14 to 19). At

Time 1 there were 161 (36.7%) freshman, 164 (37.2%) sophomores, and 116 (26.3%) juniors.

Seniors were not included here because they graduated by Time 2. Thus, there were longitudinal

data for three grade groups. The majority of students, 66.8%, lived in a "rural area (on a farm in

the country or not on a farm but in the country)," 32.1% lived "in a small town or city (less than

10,000 people)," and the remainder (1.1%) reported living in a "medium size city (between

10,000 and 200,000 people)." The sample was 84.1% White, 1.8% Native American, 0.5%

Hispanic, 4.3% reported multiple ethnicities or "other," and 9.3% chose not to self-report.

Adult advisors. There were 11 adult advisors (one school had two advisors). Ten of the

11 advisors were male and all were White. The average number of years these advisors had been

teaching was 28.8, with a range of 5 to 37 years.

Procedures

The research team staff administered questionnaires to students and advisors during the

spring of 2006, Time 1 (T1), and again in the spring of 2007, Time 2 (T2). We followed ethical

research procedures approved by the university's institutional review board. Parents received information regarding the study approximately two weeks before the scheduled administration of the questionnaires, and they could indicate if they did not want their child to participate in the study; none chose to do so. On the days of the administration, adolescents indicated their assent and completed the study questionnaire; they did not receive compensation. Advisors also gave their consent and completed a questionnaire in which they rated each student's agency-related capacities. Advisors were compensated $50 (plus $1 for each additional student if there were more than 40) for the time required to complete the measure on each student in their Chapter.

Measures

Adolescent-reported directive assistance. Three items developed for this study assessed directive assistance focusing on advisor's expectations about adolescent's work on projects in FFA. The items were, "Advisor's place high importance on finishing the projects we start," "Advisor's place high standards on youth in FFA," and "Advisor's will be disappointed with you if you do not finish what you said you would do" (reverse coded). Items were rated on a 5-point Likert scale from 1 = "Strongly disagree" to 5 = "Strongly agree." The three items were used as indicators of a latent directive assistance variable. Internal reliability for the scale was $\alpha = 0.70$ (T1) and 0.81 (T2). The latent means for directive assistance ranged from 3.28 to 3.56.

Adolescent-reported autonomy support. We operationalized autonomy support using the six-item short form of the Learning Climate Questionnaire (LCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996). The LCQ is a self-report measure that asks participants to rate the autonomy supportive conditions within a given setting. Items on the measure were worded in reference to the advisor's level of autonomy support perceived by the participant. A sample item from the scale is, "I feel that my advisor provides me choices and options." Items were on a 5-

point Likert scale from 1 = "Strongly disagree" to 5 = "Strongly agree." In previous studies, the LCQ has demonstrated strong internal consistency (e.g., $\alpha > .90$; Black & Deci, 2000).

Although the LCQ measure has a rich history in research, initial longitudinal confirmatory factor analyses (CFA; described below) of the study's conceptual model indicated problems with model fit associated with the autonomy support scale. Subsequent confirmatory factor analysis with only the LCQ measure failed to confirm the latent construct using all six items. Based on model fit indices (CFI $\geq$ .90; RMSEA $\leq$ .08), factor loadings, and modification indices, we dropped two items because they failed to load on the latent factor and no reasonable modification (e.g., correlated residuals) led to adequate model fit (i.e., CFI > .90). The two dropped items were, "I feel understood by my advisor" and "My advisor conveyed confidence in my ability to do well." The remaining four items focused on the advisor's actions related to adolescents' retaining control for ideas, plans, and work. The four items were used as indicators of a latent autonomy support variable. For the present study, Cronbach's internal reliability alphas were 0.93 (T1) and .96 (T2). The latent means for autonomy support ranged from 3.56 to 3.81.

Adolescents' self-reported capacity for exercising agency. Adolescents' self-reported capacity for agency was calculated using three scales: engagement with challenge, strategic planning scale, and responsibility and dependability. First, the *engagement with challenge* scale (EwC) included six items that assess the linkages between adolescents' intrinsic motivation and the challenges that occur from working toward a goal or a project (Moore & Hansen, 2012). Conceptually, engagement with challenge concerns the pairing of challenges and enjoyment (intrinsic motivation). Thus, items in the scale focus on this pairing, rather than on separately assessing challenge and intrinsic motivation constructs. We recognize this pairing may give the

appearance of double-barreled questions. However, the scale authors argue that in this instance separately assessing challenge and motivation would undermine the validity of the construct and increase, rather than reduce ambiguity. A sample item from the scale is: What we do in this program is both difficult and enjoyable." Students indicated their agreement with each statement using a 6-point Likert scale from 1 = "Strongly disagree" to 6 = "Strongly agree." Second, the *strategic planning scale* (SPS) was developed for this study to assess students' capacity to make and execute plans. Students rated how much they engaged in three planning strategies when working on projects in FFA: planning ahead, planning when to do tasks, and making back-up plans. The items were rated on a 5-point Likert scale with descriptive anchors of a strategy associated with the two ends and middle of the response scale. For example, in response to "How much have you planned ahead?" the anchors were 1 = "Little, I figured things out as I went along," 3 = "Some, I made a couple of specific plans before starting—figured out the rest as I went along," and 5 = "A lot, I developed a pretty complete plan of what to do before starting." Third, *personal responsibility and dependability* within the FFA was assessed with four items developed for this study. For two of the items, adolescents indicated the description that best represented "how responsible" and "how dependable" they act in FFA on a 7-point Likert scale from 1 = "Very irresponsible/ undependable" to 7 = "Very responsible/dependable." For the other two items, adolescents indicated their agreement on a 5-point Likert scale from 1 = "Strongly Disagree" to 5 = "Strongly Agree" to the following: "I have had a lot of responsibilities to do in FFA" and "I have a lot of obligations that I need to complete in FFA."

All items were first converted into a 10-point scale (percent of maximum score) in order to provide a common metric for both the advisor's ratings of each students' capacities (described next) and the adolescent-reported ratings (Little, 2013). Once in the new metric, we created a

mean score for each of the three domains of capacities for exercising agency. Creating three

mean scores rather than using all indicators from each scale was preferable since there was a

different number of items in each scale (e.g., six items for the EwC and three for the SPS). The

three mean composites were used as indicators of a latent variable of students' self-reported

capacity for agency. Internal reliability for the three mean indicator scores of students self-

reported agency was α = .75 (T1) and .76 (T2). The latent means for adolescents' self-reported

agency ranged from 5.73 to 6.15.

      Advisor's ratings of each adolescents' capacity for agency. An adult advisor of a

Chapter rated each adolescent's capacity for agency across the same three domains as the

adolescent-reported capacity for agency measure: engagement with challenges, planning, and

responsibility. The following definitions were given for each of the three domains: "Engagement

with Challenge refers to how motivated and engaged each student has been in challenging

activities of FFA;" "Planning and Executing the plan requires skill proficiency in many areas.

This includes: Advanced Planning, Scheduling, Creating Back-up Plans, Not Procrastinating, and

Monitoring and Making Adjustments;" and "Responsibility refers to being someone who can be

counted on to fulfill obligations." Advisor's rated each adolescent compared to other adolescents

of the same age/grade using a 10-point scale where 1 = '0-10%,' 2 = '11-20%,' 3 = '21-30%,' 4

= '31-40%,' 5 = '41-50%,' 6 = '51-60%,' 7 = '61-70%,' 8 = '71-80%,' 9 = '81-90%,' and 10 =

'91-100%.' The three advisor-rated items were used as indicators of a variable of adolescents'

latent capacity for agency. The internal consistency was 0.97 at both T1 and T2. The latent

means for advisor's ratings of each adolescent's capacity for agency ranged from 5.29 to 5.95.

Place Table 1 approximately here

Plan of Analysis

Preliminary analyses. We first conducted analyses to test for univariate and multivariate normality of study variable, as well as the distribution of responses on measures to identify potential scale issues (e.g., ceiling effects).

Longitudinal confirmatory factor analyses (CFA). Prior to evaluating the proposed hypotheses, we conducted a longitudinal CFA of the study's conceptual model (Figure 1) to ensure we were measuring the same latent constructs across the time and grade groups and to evaluate the homogeneity of parameters across both time and grade groups. The longitudinal CFA proceeded in the following order: evaluation of measurement invariance (i.e., configural, metric, scalar, and residual variance invariance) and evaluation of structural homogeneity (i.e., latent variances, covariances, and means).

We evaluated the quality of a given model's fit using CFI and RSMEA values. The criteria for acceptable fit were: CFI values of at least .90, and RMSEA values of .08 or less and also within the 90% confidence interval (Kline, 2015). To compare the relative fit of two nested models, we used the −2LL rescaled difference test (-2ΔLL). Therefore, a $p > .01$ indicated the more restrictive model (i.e., parameters constrained to be equal) maintained acceptable model fit compared to the less restrictive model (i.e., freely estimated parameters); conversely, a $p \leq .01$ indicated a model failed to maintain acceptable model. When a model failed to maintain fit, we used modification indices to identify parameters that were not equatable across groups and/or time. The criteria for identifying a single unequatable parameter using a modification index was $\Delta X^2 > 6$, $p < .01$ (Kline, 2015).

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Place Figure 1 approximately here

Test of hypotheses. Each regression path was tested separately for significance using the same nested model testing procedure (i.e., comparing a model with the path's parameter constrained to '0' with a model in which the parameter was freely estimated) and significance criteria described above (i.e., -2ΔLL, with $df = 1$ and $p \leq .01$). We used the nested model testing procedure rather than the Wald test because it is not affected by sample size; the Wald test uses the standard error of the estimated parameter coefficient to determine significance (Kline, 2015).

Results

Preliminary Analyses

We conducted univariate and multivariate tests of normality, since substantial departures from normality create serious problems for interpretations based on the Maximum Likelihood (ML) estimator (Byrne, 2010; DeCarlo, 1997). Mardia's (1970) omnibus test of skew and kurtosis with $p < .01$ indicated the data were not univariate or multivariate normal. Thus, we used the robust maximum likelihood estimator (MLR) in all subsequent analyses, which were conducted in Mplus, Version 6 (Muthén & Muthén, 2010). In addition, although the data were nested (students within programs), and thus violated assumptions of independence, sample size did not permit multi-level modeling. To account for the effect of the nesting of the data on the results, we used the "cluster" function in Mplus, which adjusts for the intraclass correlation with a scaling correction factor. Table 2 displays the standardized factor loadings and standard errors for the latent factors in the study's model.

Place Table 2 approximately here

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Longitudinal CFA

The longitudinal CFA model proceeded in the following order: evaluation of measurement invariance (Table 3, Panel A) and evaluation of structural homogeneity (Table 3, Panel B).

Measurement invariance. The configural measurement model was specified (i.e., all parameters freely estimated) with the second loading for each factor fixed to '1' and its corresponding intercept fixed to '0' for all grade groups and both time points to identify the model. The configural model demonstrated acceptable fit, CFI = .93, RSMEA = .06, 90% CI [.06-.070]. However, modification indices indicated there were sources of misfit due to correlated residuals (i.e., $\Delta X^2 > 6$). We deemed it important to address these sources of misfit since ignoring them could result in the error variances associated with the correlated residuals being inappropriately included in the latent parameters, which can result in unstable parameter estimates across models. We applied the following conceptual rule when deciding to allow correlated residuals in order to avoid inflating model fit solely for statistical reasons: the indicated correlated residuals had to be conceptually related, and preferably one residual had to be from the adolescent and the other from the advisor. After applying this rule, we allowed three correlated residuals, tested in sequential models starting with the largest modification index (See Table 3, Models 1.b-1.d). Fit statistics for of the final configural model (Model 1.d) was CFI = .94, RSMEA = .06, 90% CI [.054-.067].

Place Table 3 approximately here

The metric invariance model (i.e., all factor loadings held equal across time and groups) was next evaluated with the 11th grade group's Time 1 factor variances fixed to '1' as the reference group and time period. The metric invariance model did not maintain acceptable fit compared to the final configural model, $-2\Delta LL_{(45)} = 101.55$, $p < .01$. We evaluated subsequent metric invariance models (Table 3, Models 2.b-2.e), freely estimating individual factor loadings, starting with the loading associated with the largest modification index. Based upon nested model comparisons, there were four factor loadings freely estimated because they were not equatable: two T1 autonomy support items for the 9th grade group (Models 2.b-2.c), one T1 adolescent-reported planning item for the 11th grade group (Model 2.d), and one T1 directive assistance item for the 10th grade group (Model 2.e). All other factor loadings were equatable across groups and time. Since there were only two measurement time points, if a parameter was not equatable across groups it was also not equitable across time. The final, partial metric invariance model (2.e) maintained acceptable fit compared to the configural model, $-2\Delta LL_{(41)} = 48.41$, $p =.20$.

The scalar invariance model (i.e., all indicator intercepts held equal across time and groups) was next evaluated, with the 11th grade group's Time 1 latent means fixed to '0' as the reference group (Table 3, Model 3.a). The scalar invariance model maintained acceptable fit compared to the partial metric invariance model, $-2\Delta LL_{(41)} = 46.68$, $p =.25$. However, modification indices indicated that 10th grade group's intercept for the first item of T2's autonomy support measure could not be constrained to be equal to the other grade groups. After freeing this one intercept, the final, partial scalar invariance model maintained acceptable fit compared to the partial metric invariance model, $-2\Delta LL_{(40)} = 41.00$, $p = .43$, and was a

significant improvement in fit over the initial scalar invariance model, $-2\Delta LL_{(1)} = 20.34$, $p < .01$.

No additional modifications indicated.

Fit of the residual invariance model (i.e., all indicator residuals held equal across time

and groups) was next evaluated (Table 3, Model 4.a). The residual invariance model maintained

marginally acceptable fit compared to the final scalar model, $-2\Delta LL_{(59)} = 77.61$, $p = .05$.

Modification indices indicated two residual variances could not be constrained to be equal: T2's

residual variance for the 9th grade group's autonomy support item four and T2's residual

variance for 11th grade group's advisor-report of students' responsibility item. The final residual

variance model (4.c) maintained acceptable fit compared to the partial scalar invariance model,

$-2\Delta LL_{(57)} = 66.34$, $p = .19$, and significantly improved fit compared to the previous residual

invariance model (2.b), $-2\Delta LL_{(2)} = 11.27$, $p < .01$.

Structural homogeneity. Panel B of Table 3 presents results of the evaluation of

structural homogeneity. Fit of the homogeneity of the latent variances (i.e., same latent factor

variances held equal to '1' across time and groups) was first evaluated (Table 3, Model 5.a). The

latent factor variances model failed to maintain acceptable fit compared to the partial residual

invariance model (4.c). $-2\Delta LL_{(20)} = 38.54$, $p = .01$. Modification indices indicated that the 9th

grade group's T1 directive assistance variance was not equatable across groups or time. With

this parameter freed, the latent variances model demonstrated acceptable fit compared to the

partial residual invariance model (4.c), $-2\Delta LL_{(19)} = 27.88$, $p = .09$. No additional modifications

indicated. No additional modifications indicated.

Next, fit of the homogeneity of the covariances was tested. First, the within time (cross-

sectional) latent covariances were held equal across grade groups and time (6.a). This model

maintained acceptable fit compared to final latent variances model, $-2\Delta LL_{(31)} = 40.11$, $p = .13$.

Second, the homogeneity of the latent cross-lag coefficients model (7.a) maintained acceptable

fit compared to latent covariance model, $-2\Delta LL_{(23)} = 17.60$, $p = .78$. Third, the homogeneity of

the latent autocorrelations model (8.a) failed to maintain acceptable fit compared to the

homogeneity cross-lag model, $-2\Delta LL_{(8)} = 26.45$, $p < .01$. The only autocorrelation that needed to

be freed was for the 10th grade group's directive assistance, $-2\Delta LL_{(7)} = 16.58$, $p = .02$.

Finally, fit of the homogeneity of latent means model was evaluated, with factor

variances fixed to '1' as they were in the prior model (8.b) and all factor means fixed to '0'. The

homogeneity of latent means model maintained marginally acceptable fit compared to the final

autocorrelations model, $-2\Delta LL_{(20)} = 29.12$, $p = .09$. Modification indices indicated that the 11th

grade groups Time 1 mean for directive assistance was not equatable across grade groups or

time. After freeing this mean, this latent means model (9.b) maintained acceptable fit compared

to the autocorrelations model (8.b), $-2\Delta LL_{(19)} = 23.35$, $p = .22$. Although model 9.b met our fit

criteria, we subsequently freed the 9th grade groups Time 1 mean for advisor reports of youth

agency for two reasons: modification indices indicated the mean was close to being unequatable

$(\Delta X^2 = 5.30)$ *and* keeping it equated in the subsequent regression model caused parameter

instability that resulted in non-equivalent fit. After freeing this mean, the final latent means

model (9c) maintained acceptable fit compared to the autocorrelations model (8b), $-2\Delta LL_{(18)} =$

22.89, $p = .20$.

Evaluation of Study Hypotheses

To test the hypotheses, we converted all cross-lag paths from covariances to regressions

(10.a, Table 3) in a base regression model (Figure 1) that had all cross-sectional correlations and

regressions (cross-lag and autoregressions) estimated, and had the required equivalent fit to the

final latent means model (9.c). All subsequent models were compared to this base regression

model for evaluating specific latent relationships using the nested model approach (Table 4).

Place Table 4 approximately here

Cross-sectional correlations among latent factors. Nested model -2LL difference tests

were conducted to evaluated the significance of each latent correlation by comparing the fit of

the model with the correlation estimated to the model when the correlation was set to '0.' These

six tests indicated all the latent correlations were significant and positive (Table 4, Panel A). As

hypothesized, both directive assistance and autonomy support were positively correlated with

adolescent-reported capacity for agency ($r = .56$ and $r = 56$, $p < .01$, respectively) and advisor-

reports of adolescents' capacity for agency ($r = .25$ and $r = .23 p < .01$, respectively). Directive

assistance and autonomy support were moderately correlated ($r = .55$, $p < .01$) with each other,

as were adolescent-reported and advisor-reports of adolescents' capacity for agency ($r = .51$, $p <$

.01).

Longitudinal paths. The same nested model difference test was used to evaluate all

longitudinal paths. All autoregressive paths were statistically significant and positive (Table 4,

Panel B). We next evaluated the cross-lag regression paths for significance corresponding to our

hypotheses that both directive assistance and autonomy support at T1 would positively predict

both T2 adolescent-reported capacity for agency and T2 advisor-reports of adolescents' capacity

for agency (Table 4, Panel C). Of the four hypothesized paths, only T1 autonomy support

significantly predicted T2 adolescent-reported capacity for agency ($\beta = .21$, $p < .01$). This

regression path explained approximately 4% of the variance in T2 adolescent-reported agency, after controlling for T1 agency.

Finally, tests of the remaining cross-lagged paths indicated that two of the eight paths were significant (Table 4, Panel C). T1 directive assistance negatively predicted T2 autonomy support (β = -.19, $p < .01$), explaining approximately 5% of the variance in T2 autonomy support. T1 autonomy support positively predicted T2 directive assistance (β = .27, $p < .01$), explaining approximately 8% of the variance in T2 directive support.

The final pruned regression model had three significant paths: autonomy support positively predicted both future adolescent-reported agency and directive support, and directive support negatively predicted future adolescent-reported autonomy support.

Discussion

This study evaluated hypotheses that youth program adult advisors' directive assistance and autonomy support would predict adolescents' capacity for agency. Results of this study provided partial support for the hypotheses. Within each time point (cross-sectional), adolescents' perceptions of their advisor's directive assistance and autonomy support were positively and moderately correlated with adolescents' capacity for agency. Longitudinally, only autonomy support at T1 predicted adolescents' self-reported capacity for agency at T2. Overall, findings suggest directive assistance and autonomy support may both be needed for immediate exercise of agency, while only autonomy support seems to promote the over-time development of adolescents' capacity for agency.

Advisor's Supports and Adolescents' Capacity for Agency

The pattern of cross-sectional and longitudinal findings in this study suggests directive assistance and autonomy support may relate to a capacity for agency in different ways.

Directive assistance. The cross-sectional, but not longitudinal relationships, between directive assistance and adolescents' capacity for agency might reflect the functional immediacy of directive support's role—to provide a motivational context for adolescents to engage in their work and exercise agency. Advisor's directive support, then, perhaps provided "external" motivational prompts (e.g., deadlines) that helped adolescents mobilize their effort to complete projects. This finding is consistent with a qualitative study by Larson and Angus (2011) who reported that youth program advisor's directive assistance helped adolescents marshal their effort to finish projects, which was important in order for youth to "obtain the validating feedback that success provided" (p. 298).

The results of this study left the role of directive assistance for building adolescents' capacity for agency over-time ambiguous. Directive assistance at Time 1 might have failed to predict adolescents' capacities for agency at Time 2 because of our level of analysis. We analyzed a capacity for agency as a whole, rather than as its component parts. One of those component parts was personal responsibility for one's work. Larson and colleagues suggest that the directives and norms in a program for youths' work (e.g., standards for accountability for work) promote adolescents' adoption and internalization of those norms, including personal responsibility (Larson, Griffith, et al., 2014; Wood et al., 2009). In this study, directive assistance focused on adolescents' perceptions of the norms their advisors have for their work but not if these norms had become internalized as a sense of responsibility. Alternatively, T1 directive assistance's failure to predict T2 capacity for agency might indicate that directive support is not integral to fostering capacities for agency. Qualitative research suggests adult program leaders often face a delicate balancing act between exerting too little and too much control and direction

over youths' activities (Walker & Larson, 2006). Future research is needed to more fully explore the role of directive assistance and its relation to adolescents' exercise of agency.

Autonomy support. In this study, autonomy support was related to adolescents' capacity for agency at each time point and over time (self-report only). Research from self-determination theory has consistently found that support for autonomy (e.g., choice and opportunity for self-direction) promotes a greater sense of perceived competence and self-efficacy for an activity (Ryan & Deci, 2000). In the present study, autonomy support correlated with both reports (self-report and advisor) of adolescents' capacity for agency within each time point (cross-sectional), suggesting that, like directive assistance, autonomy support was related to adolescents' immediate exercise of agency. Unlike directive assistance, however, autonomy support appeared to also foster adolescents' capacity for agency over time.

Based on their qualitative research, Larson and Angus (2011) proposed that adult youth program leaders' support for adolescents' control over their work (e.g., freedom to make decisions and experiment) promotes their learning strategic thinking skills. Larson and Angus (2011) described strategic thinking skills as "Thinking that involves the inference of system processes as a means to anticipate events and formulate courses of action to achieve goals in the program" (p. 282). Results of the current study provides some support for this proposition as strategic planning was one component of our operationalization of adolescents' capacity for agency. However, the present findings suggest that the role of autonomy support may not be limited to fostering strategic thinking. Autonomy support may also play a role in fostering other capacities needed for exercising agency. Self-determination theory research has found that support for autonomy facilitates intrinsic motivation, an inclination to seek out novelty and challenge, and experience them as rewarding (Ryan & Deci, 2000). In this study, we

operationalized the motivational component of a capacity for agency as enjoyment of meeting

and overcoming challenges that occur while working toward a goal or project. Thus, the current

findings are consistent with self-determination theory research.

Strengths and Limitations

Our operationalization of adolescents' capacity for agency differed in important ways

from other lines of research on agency. Much of the research on agency focuses on the outcomes

of individuals' agency-related beliefs or perceptions of their ability (Bandura, 1982; Shogren,

Little, & Wehmeyer, 2017). In this study, we focused on three capacities for exercising agency

because, theoretically, they transfer across different settings and because youth program leaders

can intentionally structure opportunities to build these capacities. We presume that building these

capacities would also facilitate adolescents' agency-related beliefs, but we did not assess agency-

related beliefs, which could have provided validity evidence for our agency construct. It would

be important to assess both capacities and beliefs in a future study. We also think there is

important measure development work to be done on these three, and perhaps additional, agency-

related capacities.

There could be at least two reasons that directive assistance and autonomy support at

Time 1 failed to predict T2 advisor's reports of adolescents' capacity for agency. First, to ease

time demands, we asked advisors to rate each youth in their program (40+ youth) with three

items representing the three capacities, rather than with the same 13 items adolescents rated,

which resulted in non-equivalent measures of agency capacity between youth and advisors.

Despite non-equivalent measures, however, there was a moderately strong cross-sectional

correlation between advisor-reported and adolescent-reported capacity for agency, $r = .54$.

Second, we may have inadvertently reduced the likelihood of finding change in advisor's reports

of adolescents' capacity agency because advisors used an age-norm rating scale (i.e., agency in relation to peers of same age) and not a criterion-referenced scale (e.g., change in capacity relative to individual's past). Thus, an individual's change in the capacity for agency would need to be exceptional relative to peers to indicate growth. Partial evidence for this explanation can be seen in the significant cross-sectional correlations between both directive support and autonomy support and advisor's ratings.

We sampled youth programs from the same organization that followed a common youth development curriculum, which helped reduce that likelihood that the pattern of findings were due to curricular or organizational differences. Although advantageous for present purposes, the purposive sampling leaves unanswered questions about the variation and impact of these foundational conditions across the range of youth programs (e.g., sports, arts, academic clubs) and the settings (e.g., urban). For example, how does participation in youth programs that, of necessity, limit choice and control over tasks and activities (e.g., organized youth sport practice) affect learning different capacities for the exercise of agency? Addressing this and related types of questions in future research could provide valuable insights into how to promote the development of capacities for exercising agency across the spectrum of youth programs.

Finally, we did not examine adolescents' patterns of involvement in projects and Chapter activities, which would be important in subsequent research to evaluate their relation to a capacity for exercising agency. Quantitative research has found correlations between indicators of "dosage" (e.g., number of hours participating in program) and developmental outcomes (Fredricks & Eccles, 2006). Qualitative research also suggests that being able to work on projects over extended periods of time is a key factor that promotes adolescents' development of different capacities for agency (Larson & Angus, 2011; Larson & Hansen, 2005). Future research, then,

could assess different indicators of involvement in projects and activities, and how these indicators interact with the type of support advisors provide to facilitate the development of a capacity for agency.

Conclusion

Overall, both directive assistance and autonomy support appeared related to a capacity for exercising agency at a given time, but only autonomy support appeared to help youth build a capacity for agency over time. This pattern suggests that the types of support adolescents receive could differentially affect their development of a capacity for exercising agency. For long-term development of agency, providing adolescents with autonomy support might be the more effective strategy. Given the salience of a capacity for agency in adulthood, it will become increasingly important for educators and society to understanding how to support its development.

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PROGRAM LEADER SUPPORTS AND ADOLESCENT AGENCY

Table 1. Latent Factor Means and Standard Errors (SE) across Grade Groups and Time

Scale	9th Grade Group		10th Grade Group		11th Grade Group	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Directive Assistance (range 1-5)	3.56	3.48	3.37	3.28	3.75	3.51
	(0.07)	(0.14)	(0.10)	(0.15)	(0.04)	(0.18)
Autonomy Support (range 1-5)	3.79	3.64	3.81	3.59	3.76	3.63
	(0.18)	(0.19)	(0.18)	(0.24)	(0.19)	(0.24)
Adolescent-Reported Capacity for Agency (range 1-10)	6.14	6.15	5.77	5.78	5.92	5.73
	(0.10)	(0.14)	(0.25)	(0.26)	(0.22)	(0.15)
Advisor-Reports of Adolescent's Capacity for Agency (range 1-10)	5.29	5.47	5.34	5.76	5.93	5.95
	(0.45)	(0.35)	(0.39)	(0.59)	(0.39)	(0.46)

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Table 2. Standardized Factor Loadings and Standard Errors for Study Constructs by Grade Groups and Time

	9th Grade Group		10th Grade Group		11th Grade Group	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Directive Assistance	λ (SE)	λ (SE)	λ (SE)	λ (SE)	λ (SE)	λ (SE)
Item 1	.58 (.05)	.72 (.04)	.82 (.09)	.67 (.05)	.60 (.06)	.67 (.05)
Item 2	.78 (.05)	.88 (.03)	.87 (.04)	.87 (.04)	.80 (.04)	.88 (.06)
Item 3	.57 (.04)	.71 (.04)	.66 (.04)	.66 (.04)	.59 (.04)	.59 (.06)
Autonomy Support*						
Item 1	.78 (.02)	.87 (.04)	.83 (.04)	.75 (.07)	.84 (.04)	.75 (.07)
Item 2	.71 (.06)	.91 (.02)	.88 (.03)	.91 (.01)	.82 (.03)	.85 (.05)
Item 3	.91 (.02)	.93 (.01)	.91 (.02)	.93 (.02)	.91 (.02)	.95 (.02)
Item 4	.92 (.01)	.88 (.04)	.91 (.01)	.93 (.01)	.92 (.01)	.91 (.02)
Adolescent-Reported Capacity for Agency						
Engagement with Challenge[1]	.80 (.03)	.80 (.03)	.77 (.03)	.80 (.03)	.80 (.03)	.75 (.06)
Strategic Planning[1]	.59 (.04)	.59 (.04)	.59 (.04)	.59 (.04)	.41 (.12)	.62 (.08)
Responsibility & Dependability[1]	.78 (.03)	.78 (.03)	.78 (.03)	.78 (.03)	.78 (.03)	.80 (.06)
Advisor-Reports of Adolescent's Capacity for Agency						
Engagement with Challenge	.96 (.01)	.95 (.01)	.96 (.01)	.95 (.01)	.96 (.01)	.93 (.04)
Strategic Planning	.93 (.02)	.93 (.02)	.93 (.02)	.93 (.02)	.93 (.02)	.93 (.03)
Responsibility & Dependability	.97 (.01)	.97 (.01)	.97 (.01)	.97 (.01)	.97 (.01)	.94 (.02)

Note. Loadings taken from final CFA model. *Two of the six items were dropped because they failed to load on factor. [1]Based on mean scores.

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Table 3. Longitudinal CFA Results

Model	# Free Par.	-2LL Value	Scale Factor	CFI	RSMEA Value	Lower CI	Upper CI	p-value
Panel A. Measurement Invariance								
1.a Configural	357	-11,941.49	1.59	0.93	0.06	0.06	0.07	<.01
1.b Configural (11th T1 A-RS w/ T1 DIR-4)	358	-11,935.68	1.57	0.94	0.06	0.06	0.07	<.01
1.c Configural (11th T1 Y-EC w/ T1 A-EC)	359	-11,930.42	1.57	0.94	0.06	0.06	0.07	<.01
1.d Configural (10th T1 Y-RS w/ T2 Y-EC)	360	-11,924.62	1.56	0.94	0.06	0.05	0.07	<.01
2.a Metric	315	-11,976.46	1.64	0.93	0.06	0.06	0.07	<.01
2.b Metric (9th T1 AS-2)	316	-11,965.66	1.63	0.93	0.06	0.05	0.07	<.01
2.c Metric (9th T1 AS-1)	317	-11,957.23	1.63	0.94	0.06	0.05	0.07	0.01
2.d Metric (11th T1 Y-PN)	318	-11,953.10	1.63	0.94	0.06	0.05	0.07	0.01
2.e Metric (10th T1 DS-1)	319	-11,949.76	1.63	0.94	0.06	0.05	0.07	0.01
3.a Scalar	278	-11,978.08	1.69	0.94	0.06	0.05	0.06	0.03
3.b Scalar (10th T2 AS-1)	279	-11,975.10	1.68	0.94	0.06	0.05	0.06	0.03
4.a Residual Variance	220	-12,047.35	1.63	0.94	0.06	0.05	0.06	0.06
4.b Residual Variance (11th T2 A-RS)	221	-12,041.99	1.64	0.94	0.06	0.05	0.06	0.07
4.c Residual Variance (9th T2 AS-4)	222	-12,036.78	1.63	0.94	0.06	0.05	0.06	0.09
Panel B. Structural Homogeneity								
5.a Factor Variance	202	-12,056.86	1.70	0.94	0.06	0.05	0.06	0.06
5.b Factor Variance (9th T1 DIR)	203	-12,052.17	1.69	0.94	0.06	0.05	0.06	0.09
6.a Factor Covariance	172	-12,075.34	1.78	0.94	0.06	0.05	0.06	0.10
7.a Factor Cross Lags	149	-12,083.85	1.91	0.94	0.05	0.05	0.06	0.11
8.a Factor Autocorrelations	141	-12,093.50	1.98	0.94	0.06	0.05	0.06	0.11
8.b Factor Autocorrelations (10th DIR)	142	-12,090.27	1.97	0.94	0.05	0.05	0.06	0.13
9.a Factor Means	122	-12,112.77	2.04	0.94	0.05	0.05	0.06	0.12
9.b Factor Means (11th T1 DIR)	123	-12,108.53	2.03	0.94	0.05	0.05	0.06	0.14
9.c Factor Means (9th T1 A-AG)	124	-12,105.60	2.06	0.94	0.05	0.05	0.06	0.14
10.a Base Regression Model	124	-12,105.12	2.04	0.94	0.05	0.05	0.06	0.15

Note. AS = youth reported autonomy support; DS = youth reported directive assistance; A-RS = Advisor reports youth responsibility; A-EC = Advisor reports youth engagement with challenge; Y-EC = Youth reported engagement with challenge; Y-PN = youth reported planning; A-AG = Advisor reports of youth agency

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Table 4. Standardized Parameter Estimates and Tests of Pathways among Latent Factors

	β	*SE*	-2LL Value	Scale Factor	*p*
A. Cross-Sectional Correlations					
DS <—> Y-AG	0.56	.07	-12146.38	2.08	< .01
DS <—> A-AG	0.25	.03	-12115.00	2.06	< .01
AS <—> Y-AG	0.56	.02	-12173.38	2.09	< .01
AS <—> A-AG	0.23	.06	-12118.84	2.04	< .01
DS <—> AS	0.55	.06	-12153.17	2.09	< .01
Y-AG <—> A-AG	0.51	.08	-12166.54	2.02	< .01
B. Autoregressive Paths					
DS (9th and 11th grade groups)	0.18	.16	-12106.76	2.04	< .01
DS —10th only[1]	0.33	.13	-12108.96	2.05	<.01
AS	0.71	.03	-12138.80	2.08	< .01
Y-AG	0.44	.13	-12113.27	2.04	< .01
A-AG	0.54	.13	-12134.90	2.03	< .01
C. Cross-Lagged Regressive Paths					
T1 DS → T2 Y-AG	-0.12	.06	-12106.29	2.05	0.06
T1 DS → T2 A-AG	0.05	.06	-12105.38	2.04	0.45
T1 AS → T2 Y-AG	0.21	.08	-12107.91	2.05	< .01
T1 AS → T2 A-AG	0.14	.09	-12106.82	2.04	0.07
T1 DS → T2 AS	-0.19	.07	-12108.94	2.04	< .01
T1 AS → T2 DS	0.27	.05	-12110.15	2.06	< .01
T1 Y-AG → T2 DS	0.04	.18	-12106.74	2.03	0.22
T1 A-AG → T2 DS	0.08	.08	-12107.12	2.04	0.08
T1 Y-AG → T2 AS	-0.09	.08	-12107.19	2.05	0.02
T1 A-AG → T2 AS	0.07	.09	-12107.03	2.04	0.12
T1 A-AG → T2 Y-AG	0.12	.08	-12106.87	2.04	0.05
T1 Y-AG → T2 A-AG	-0.05	.07	-12107.91	2.04	0.05

Note. Parameters tested using −2ΔLL rescaled difference test with *df* = 1 (*p* < .01); 10.a base regression model in Table 3 is reference model. AS = youth reported autonomy support; DS = youth reported directive support; Y-AG = youth reported agency; A-AG = Advisor reports of youth agency. [1]Non-equivalent covariance required testing this path separately. Parameters in a panel above the dashed line represent the a priori hypothesized paths.

Figure 1. Conceptual Model
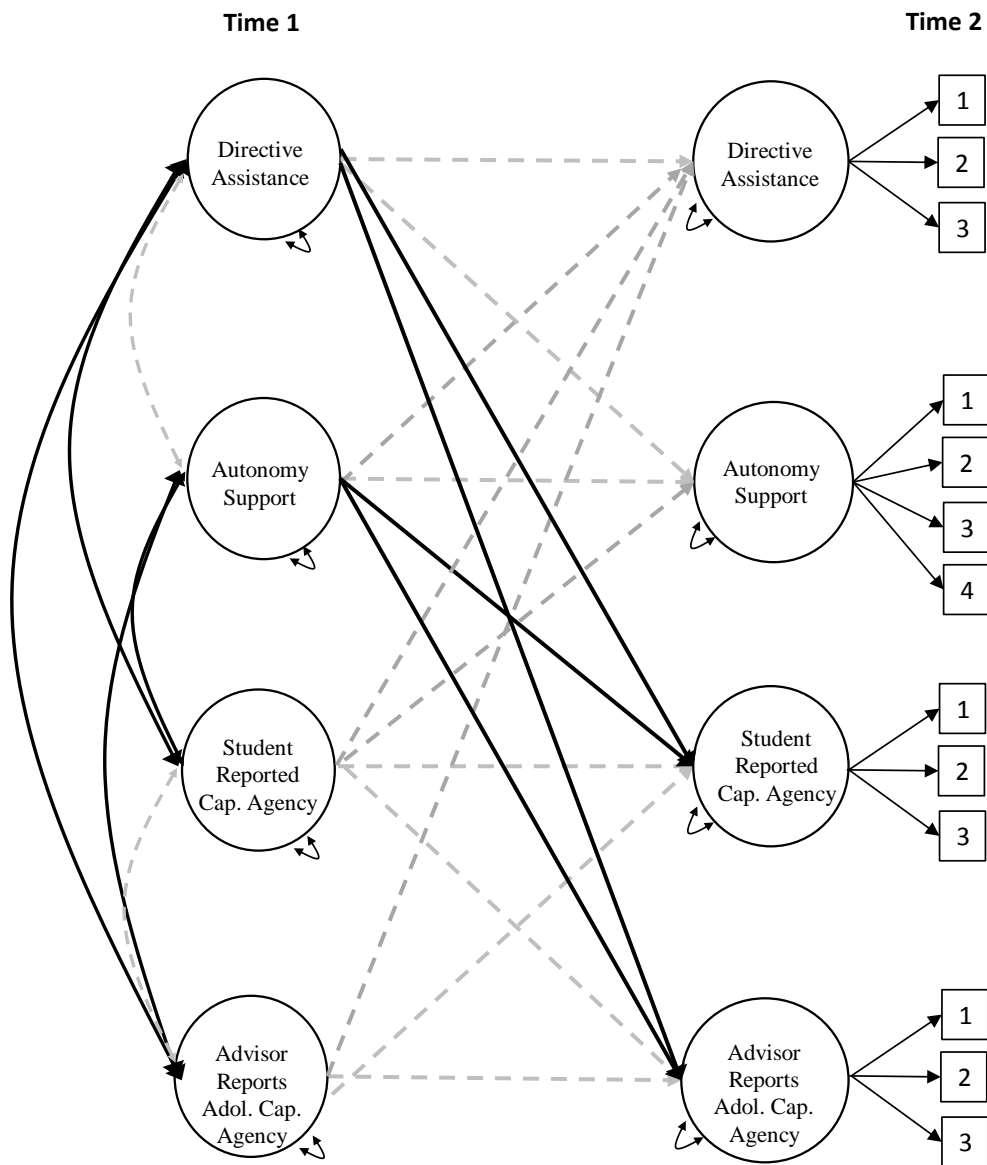
Note. Loadings paths depicted for one time point to save space. Solid Bold lines represent hypothesized paths. Grey dashed lines represent autoregressive and non-hypothesized paths.