The life trajectory interview for youth (LTI-Y): Method development and psychometric properties of a measure to assess life course models and achievement

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Abstract: This paper describes the rationale, development, and psychometric properties of the life trajectory interview for youth (LTI-Y), a measure designed to assess cognitive models of the life course and life course achievement. This method was developed over 13 months of pilot research, and applied with a population of 350 participants from the Great Smoky Mountain Study, a longitudinal epidemiologic study of mental health in Western North Carolina comprising 1420 youths (among them 350 Cherokee Native Americans). The LTI-Y is designed to address gaps in our understanding of the links between large-scale structural conditions and social processes and individual outcomes such as mental health. Scale consistency (n = 350) was good to high, while test-retest reliability (n = 18) was moderate to good, depending on the domain and dimension of data considered. Overall, psychometric properties indicate fairly stable and consistent life course strategies and priorities. Although developed and piloted with youth from Western North Carolina, the methods described could be applied to any population of interest.

Key words: psychiatric epidemiology, life goals, achievement, anthropology, psychometrics
**Introduction**

**Rationale**

This report describes the rationale and procedures involved in developing the life trajectory interview for youth (LTI-Y). As a complement to the ongoing collection of mental health data of youth for the Great Smoky Mountains Study (GSMS), this interview assesses individual and cultural models of the life course as well as personal life course status. GSMS is a longitudinal epidemiologic study of mental health risk among youth and families living in Western North Carolina that has characterized psychiatric status and identified risk factors from late childhood through adolescence (Angold, Costello, and Worthman, 1998; Maughan, Pickles, Rowe, Costello, and Angold, 2000; Costello, Compton, Erkanli, and Angold, 2001; Costello, Compton, Keeler, and Angold, 2003). In this subcomponent of GSMS, we aimed to put flesh on the statistical bones of our epidemiologic findings via ethnographic techniques that would also yield quantitative data compatible with epidemiological datasets. The LTI is designed to (1) elicit models of economic and social success, as well as life course achievement and derailment, (2) identify how individuals position themselves with respect to these models (both in terms of cognitive endorsement and “real life” approximation), (3) test how this relates to individual mental health trajectories across the lifespan, and (4) characterize participants' understanding of how individual behavior and extrinsic events may act to “derail” life course goals.

The work was prompted by the need to engage how culture works “on the ground” to make a difference at the level of individual experience and behavior. The role of culture or ethnicity in outcomes of interest (e.g., differential well being, school performance, decision making) has claimed intensifying scrutiny from social scientists and clinicians (Al-Issa and Tousignant, 1997; Kowalski and Westen, 2004; Dana, 2005). A challenge to investigation of this role has been a dearth of conceptual and methodological bridges between two levels of
analysis, population and individual. Culture/ethnicity (the two are not synonymous, but often are used interchangeably) is a population-level concept comprising the distribution of beliefs, values, and practices, but also necessarily operates at the individual level where cultural knowledge is held, produced, and enacted. By contrast, conditions or outcomes of interest such as health, social competence, poverty, or aging are tagged at the level of individuals, though they necessarily are informed by structural, historical, and other factors at the population level.

A growing body of work aims to bridge this gap. Building on (Barth, 1975), Sperber and colleagues have argued for an epidemiologic approach to culture as regularities distributed in time and space (Sperber, 1985) produced through causal links to cognition and behavior (Sperber, 1996; Sperber and Hirschfeld, 2004). From a view of culture as shared, motivating, and meaningful, cultural consensus modeling (CCM) aims to map the distribution of cultural knowledge (Romney, Weller, and Batchelder, 1986; Dressler, 1991; Romney and Moore, 1998). An important application of CCM has linked individual cultural competence (knowledge of modal population views) and consonance (conformity to the population norm) to mental and physical health (Dressler, 1991; Dressler and Bindon, 2000).

By contrast with such epidemiologic approaches, cognitive perspectives on the organization of cultural knowledge as working representations have shown that domains of culture are organized as related content maps (cultural models), cognitive schemas, and behavioral scripts that ground understanding, motivation, and action (D'Andrade, 1992; Shore, 1996; Strauss and Quinn, 1997). From an independent developmental perspective, pathbreaking work by Linda Burton demonstrated that ethnic differences in working models of the life course informed distinctive ordering of life events among socioeconomically disadvantaged urban African Americans (Burton, 1990). This work, along with life-span development theory (Hetherington, Lerner, and Perlmutter, 1988; Lerner, 2002), has
prompted the current focus on factors regulating acquisition or selection and pursuit of developmental models and goals across the life course (Heckhausen, 1999; Dweck and London, 2004). Meanwhile, work on logic under constraint has shown that underlying values and priorities emerge when constraints are placed on choice (Shweder, Jensen, and Goldstein, 1995). Life often involves difficult choices, so the capacity to make choices that “work” (are feasible and personally and socially acceptable) can be an important marker of coping capacity.

The immediate question that informs the method reported here concerns how cultural epidemiology and the distribution of cognitive models maps onto the developmental epidemiology of success and risk in the youth to adult transition. Earlier work suggests three crucial features of research on individual development and psychobehavioral risk: (1) A developmental life course perspective is necessary for understanding individual pathways of risk and resilience (Masten, Burt, Roisman, Obradovic, Long, and Tellegen, 2004); (2) These pathways depend heavily on individual ability to “make meaning” out of life, and to interpret and integrate experiences into ongoing behavioral patterns (Brandstätter and Lerner, 1999; Emde and Spicer, 2000); (3) Cultural frameworks both structure and aid (or hinder) this personal integration process; hence, individual risk/resilience pathways are strongly embedded in sociocultural dynamics (Burton, 1990; Spencer, 2001). Accordingly, we have reworked cultural consensus methods to elicit cultural models of expected and desired life course contents (milestones; social and material goods) and of the factors that advance or impede their attainment.

Sample background

The sample in this study is composed of youths aged 19-24 from the Great Smoky Mountains Study (GSMS), a longitudinal study of mental health in Western North Carolina.
GSMS youth were originally recruited in three cohorts aged 9, 11, and 13. Of the 1420 total participants, 350 are Native Americans from the Eastern Band of the Cherokee Indian (EBCI), who are a saturation sample of all Cherokee in the appropriate age ranges who agreed to the study. The remaining 1070 participants are a representative sample of youth living in the 11 counties of Western North Carolina. Potential participants were selected from the population of some 20,000 children using a household equal probability, accelerated cohort design (Schaie, 1965), and were oversampled for risk using a phone screening interview. A full description of the methods used in GSMS recruitment and data collection can be found in other publications (Costello, Angold, Burns, Stangl, Tweed, Erkanli, and Worthman, 1996).

For the past 11 years, participants have been interviewed either annually (to age 16) or every 2-3 years (ages 16-21) using the Child and Adolescent Psychiatric Assessment (CAPA) and Young Adult Psychiatric Assessment (YAPA) interviews (Angold and Costello, 1995; Messer, Angold, Costello, and Burns, 1996; Angold and Costello, 2000), developed at the Duke Center for Developmental Epidemiology (http://devepi.duhs.duke.edu/). The CAPA/YAPA is an interviewer driven, response-based interview that can be effectively administered by trained non-clinicians, and assesses psychiatric symptoms and diagnoses for every DSM-IV disorder, as well as family and community risk, participant service use, and a wide range of demographic variables concerning employment, schooling, income, and neighborhood characteristics. Ongoing data collection with GSMS participants also includes biomarkers of puberty, stress, and physical health, and anthropometrics (McDade, Stallings, Angold, Costello, Burleson, Cacioppo, Glaser, and Worthman, 2000; Angold, Worthman, and Costello, 2003; Eaves, Silberg, Foley, Bulik, Maes, Erkanli, Angold, Costello, and Worthman, 2004; Rowe, Maughan, Worthman, Costello, and Angold, 2004), as well as parental psychiatric status.
Methods
Method development

Pilot work involved a mixture of detailed one-on-one ethnographic life history interviews (n=22), focus groups (16 total, n=60), and pilot card sort procedures followed by debriefing interviews (n=149). The method development process (Figure 1) involved two full-time researchers as well as input from local cultural “experts” (within and outside of professional social science and mental health intervention). Furthermore, both full-time field researchers had full ethnologic immersion in the study area: one researcher in the more rural Southern and Western reaches on the border of the Cherokee Reservation, and the other located solidly in the urban, peri-urban, and rural areas of the Northern and Eastern region.

A combination of existing theory and research concerning dimensions of the life course as well as extensive individual and focus group conversations with a population of youth age- and ethnicity-matched to the GSMS sample led to the delineation of four major life course domains: (1) life course milestones, twelve items considered “most important” to achieve for both men and women by local participants (e.g., get a career / permanent job, have and raise children)\(^1\); (2) life course barriers, 20 items considered most likely to disrupt or delay life course achievement; (3) social affordances\(^2\), composed of 20 community, family, and

\(^1\) Initially, inquiries into this domain and generated item sets were gender-specific. However, after an iterative set of focus groups and pilot card sorts, it became apparent that a set of cards could be derived that would adequately capture the top twelve milestones for both men and women.

\(^2\) This domain was perhaps the most difficult to finalize, as it was originally conceptualized as two separate domains; (1) items important for the achievement of life satisfaction, and (2) items that helped to aid life course achievement. In fact, these domains were kept separate throughout the entire pilot stage. However, when the LTTI domains and items were finalized, it was found that the list of items for these two domains overlapped so significantly that the two domains should be combined into one. If not for the wealth of content and quantitative data yielded by a significant number of pilot card sorts, our research group would not have had the empirical grounds to confidently combine the two domains that we originally had viewed as separate.
individual characteristics considered most important to “be happy and satisfied in life”; (4) **material goods**, 15 items considered the most important markers of “living the good life.” (See Appendix 1 for full list of cards in their original wording). Each of these domains was probed at two levels of participant response; once for the perceived views and priorities of the “average American,” and once for personal views and priorities. Several life course dimensions were also assessed. Participants provided estimates of the proper age of achievement and ranked difficulty of achievement for life course milestones. For milestones, social affordances, and material goods, they provided information on “ability to do without” by excluding items one-by-one until only the “essentials” were left, and they also ranked the “importance” of these remaining essential cards. For life course barriers participants provided ranked assessment of item relevance, negative impact, and personal concern (see below for a fuller description of card sort methods).

*LTI-Y interview layout*

The LTI-Y begins with an initial demographics section to establish rapport and to obtain an interim report (between main GSMS interviews) of participant marital, residence, employment, schooling, and parity status. Completion of this section took on average 15 minutes. For Cherokee participants only, the initial demographics portion was followed by a 10-minute section concerning money received as a result of profits from the Cherokee Casino (amount received, past and future planned spending patterns, etc)³. The Mood and Feelings Questionnaire (MFQ) (Angold, 1989), a structured assessment of dysphoric mood (completion time ~5 minutes) then directly preceded the centerpiece of the LTI-Y, the card sort procedure, which took approximately 50 minutes to complete (range 20 – 90 minutes). Finally, a series of questions elicited participants’ life course status on all of the items

³ Previous analyses have shown that biannual Tribal disbursements generated by the Cherokee casino (the so-called “percap”) has significantly influenced the mental health of GSMS participants, particularly though its potential to lift families out of poverty (and accompanying changes in parental monitoring) (E. Costello et al., 2003).
assessed in the card sort portion, which took approximately 20 minutes to complete. Progress through the interview was timed: generally, the entire LTI-Y took one and a half hours to complete (slightly more for Cherokee, who were asked to complete an additional section). Interview sections were not counterbalanced for order, as the interview was carefully designed to begin with basic questions (for rapport-building), maximize cognitive complexity in the middle of the interview, and diminish respondent burden towards the interview’s close.

Card sort procedure

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**Life course milestones:** Life course milestones were assessed along four key dimensions. The first was *age*, in which participants were asked to mark on each card “earliest acceptable age, ideal age, and latest acceptable age,” according to the “average American.” The next dimension collected was *exclusion*. Following the age-labeling task, participants were asked to consider all twelve milestones and to remove the “least important event to the average American…in terms of having a basic, straightforward, ‘bare bones’ life.” Respondents were then asked to continue removing cards, each time eliminating the least important event “until what you have left is the bare minimum...” Left with a “minimal model” of life course milestones, participants were then asked to rank these cards by *importance*. The final dimension assessed for milestones was that of *difficulty*. Presented with another set of cards listing the twelve life course milestones, participants were then asked to “put the cards in order from most difficult to least difficult, according to mainstream American opinion.” Finally, respondents completed the exclusion, importance, and difficulty tasks one more time, but this time “thinking about yourself, and your own needs and wishes,
no matter what anyone else thinks.” This procedure elicited the personal or “self” layer of data for life course milestones.

Life course barriers: Life course barriers aimed to assess participant views about what could delay, block, or prohibit life course achievement. Data collected for life course barriers assessed the dimensions of relevance, impact, exclusion, and concern. The first dimension probed was relevance. Participants were given all 20 cards together, and asked to rank them “for how common or often these things come up in folks’ lives.” To clarify this concept of community relevance, participants were given the following instructions: “The first card you pick will be the card that happens most often. It might not be the worst thing; it might not be all that bad—but it happens the most to people.” Next, participants were asked to rank all 20 cards according to impact, given the following instructions: “This time your job is to sort them [the cards] according to what causes the most damage. First, please pick out the most destructive thing out of all of these. This may or may not happen very often, but when it does happen, it is really a big deal. It really messes people up, has a big impact, and gets in the way of a lot of different things.”

Exclusion and concern were assessed for life course referred to the personal life course of the participant. Given all 20 barriers cards once again, they were asked to remove the one item “that applies least to your own life, either in the past, present, or future. In other words, this is something that is least likely to happen to you—it is really not on your list of concerns.” Participants were then asked to continue removing cards, each time excluding the card least applicable to themselves, “until all the cards on the table [not excluded] apply to your own life in some way.” Given this set of remaining cards that respondents had identified as relevant to their own lives, they were then asked to rank the cards according to personal concern. To help clarify this dimension and initiate the ranking procedure, participants were instructed to “pick the one that is the biggest concern to you. This could be something that
messed you up in the past and is still affecting you, or it could be something that is affecting you in your life right now. In any case, this should be the card that is the biggest deal to you.” The rest of the cards were ordered by personal concern, ending with the card of least concern.

Social affordances: The list of social affordances included 20 items considered most important to be “happy and satisfied in life.” The two dimensions assessed for social affordances were exclusion and importance (for both average Americans and the self). This exercise yielded a list of all the items participants felt average Americans could do without and still be happy and satisfied in life (in order from most to least expendable), and a list of all the items they felt average Americans would most want to retain in order to be happy and satisfied in life (in order from most to least important). Then, the same procedure was used to elicit participants’ personal priorities and desires.

Material goods: Similar to the social affordances domain, only the dimensions of exclusion and importance were collected for material goods. Just as with social affordances, responses produced a list of all the expendable items (ordered from most to least expendable) and a list of all the items considered most important for the good life (ordered from most to least important). As with the other domains, data were collected for both participants’ best estimates of average American and then their own personal views.

Life course status questionnaire

For every item in each life course domain (milestones, barriers, social affordances, and material goods), a questionnaire assessed participant “real life” status, to gauge the extent to which their own lives matched models of the life course. To assess participant status regarding social affordances and barriers, participants answered questions with Likert-scale response options (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) for each item. Items were taken verbatim from the cards as much as possible, but
reworded in the form of an “I” statement. For example, “I have problems overspending or
going into debt,” or “I have status, power, and respect in the community.” For life course
milestones and material goods, participants stated whether they had currently achieved each
item (yes/no), whether they had achieved this item in the past (yes/no), or whether they
expected to achieved this item in the future (yes/no/maybe).

**Goodman ladder, projected life span**

To complement assessment of life course models and patterns of achievement on the
range of items generated by local participants, we also assessed global subjective life course
status using the “Goodman ladder” (Goodman, 1999; Goodman, Amick, Rezendes, Levine,
Kagan, Rogers, and Tarlov, 2000; Goodman, Adler, Kawachi, Frazier, Huang, and Colditz,
2001). This measure asks participants to rate themselves vis-à-vis other people with regards
to SES and social popularity / centrality by marking a “rung” of a ladder representing the
entire (imagined) range of variation. For the LTI-Y, we modified a basic version of the
Goodman ladder to assess participant current SES, future projected SES, SES for family of
origin, and participant social popularity / centrality.

Following the Goodman ladder, participants were asked to assess their future
projected life span, with the following response possibilities: 30, 40, 50, 60, 70, 80, 90, 100,
and “over 100.” Not only is projected life span expected to act as a significant moderator of
life course planning, it is also expected to reflect a more global perspective on life chances,
and pertains to behavioral patterns extant in GSMS data (i.e. risk-taking) (Hill, Thomson
Ross, and Low, 1997; Chisholm, 1999).
Mood and Feelings Questionnaire (MFQ)

Mood is known to colour responses to psychological probes and questionnaires (Westermann, Spies, Stahl, and Hesse, 1996). Current participant status regarding mood dysfunction/dysphoria was assessed with the Mood and Feelings Questionnaire (MFQ), a 13-item measure to assess mood-related dysfunction for the past two weeks with well-documented and respectable psychometric properties (Angold, 1989; Messer, Angold, Costello, Loeber, and et al., 1995). For example, participants were asked to respond to the statement “I didn’t enjoy anything at all” (true/ sometimes true/ not true).

Sampling

At the time of the LTI-Y interview, the three waves of GSMS participants were 19, 21, and 23 years of age (average age = 21.23 ± .09 [SE], min = 19, max = 24). The LTI-Y was administered to a subsample of 350 GSMS participants. This subsample was based on a 16-cell stratified design, using the four dichotomous dimensions of gender, ethnicity, family stability, and early poverty (see Table 1). Eighteen of these 350 participants also completed the LTI-Y with 6-15 days after the original interview, in order to assess test-retest reliability of the LTI-Y.

Age did not differ by ethnicity, gender, or exposure to early poverty, but participants with stable family backgrounds were slightly older than those without (mean difference = .64 years ± .18 (SE), p = .0005, 2-tailed t-test). Family poverty was unrelated to gender, ethnicity, and family instability. However, family poverty did show an ethnic difference; while Cherokees were just as likely as Anglos to report a history of family instability, they...
were 28.22% more likely to have a history of family poverty (± 5.19% [SE], p < .001, 2-tailed test).

Interviewing logistics and sample recruitment

The entire interviewing process (including test-retest) took 18 months, and required the work of three interviewers (the main author and two field interviewers). One of the field interviewers took part in the majority of the pilot phase as well as the entire LTI-Y interviewing phase, while the other was specifically trained only on the LTI-Y, and was hired for an 8-month span only to accelerate data collection among the Cherokee. Of the 1420 total GSMS participants, only Anglos and Cherokees were formally sampled. For anecdotal comparative purposes, one African America male and one African American female completed the LTI-Y and an accompanying life history interview. However, with fewer than 80 total African American participants in the sample, it was considered unlikely that a sufficient sample could have been recruited for comparative purposes with Anglo and Cherokee.

Results

The following section describes scale/internal consistency and test-retest reliability for the LTI-Y. Descriptive results concerning initial data analysis can be found elsewhere (Brown and Worthman, 2005a; Brown and Worthman, 2005b). Scale and internal consistency analysis was performed with all 350 participants, and represents the internal consistency of responses within individual domains and dimensions of measurement. Meanwhile, test-retest reliability was performed with a subset of 18 participants who completed the LTI-Y a second time within 6-15 days of the original interview. Because of the
heterogeneous nature of data generated by the card sort procedure, several different analytical techniques were required to assess test-retest reliability (see below)

*Scale analysis: internal consistency (n=350)*

Of all the dimensions and measurements taken by the life course card sort, only two are amenable to formal scale consistency analysis: item exclusion and life course status. All other dimensions are forced-ranking tasks yielding non-independent data that cannot be assessed by standard measures of scale consistency. Customary cut-offs for acceptable Cronbach’s alpha and KR20 estimates of scale consistency are .70, although cut-offs of .5 or .6 are typically acceptable for measures that are not diagnostic in nature, and/or are new or exploratory (Nunnally, 1967). With the exception of the life course milestones (exclusion and status) and material goods (status), all Cronbach’s alpha/KR20 estimates for both participant status and item exclusion were .70 or higher (Table 3).

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*Insert Table 3 about here*

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Another domain of data in the LTI-Y, personal status on life course barriers, is amenable to internal consistency analysis. Participants were asked to assess their status with regards to personal barriers in two different ways; once in a card sort and once in a verbal questionnaire format. This allows us to assess the agreement between card sort and questionnaire responses. As the Likert-scaled questionnaire format is a more traditional way of assessing life experiences, this allows us another view of the validity of the card sort procedure.

The card sort is a newer kind of procedure, and one in which there can be more anonymity of response. For example, a participant might include “addiction” in his or her list
of personal concerns for the card sort, but hide the card in a stack of other concerns, or simply hand this card to the interviewer face down, preserving anonymity of response and protecting against any loss of face or embarrassment. Meanwhile, the questionnaire probe “I have problems with addiction to drugs, alcohol, or anything else,” requires a direct response to the interviewer, which may incur some loss of face or embarrassment. Thus, it is important to assess two different kind of consistency here: (a) a barrier was indicated as a concern in the card sort but not in the verbal questionnaire (which may be a result of the increased anonymity allowed in the card sort), (b) a barrier was not indicated in the card sort but was responded to positively in the verbal questionnaire (which might indicating that the card sort was not “doing its job” in capturing individual barrier status). Importantly, errors of type (a) far out number errors of type (b); the mean number of type (a) errors was .95 (± .07 [SE], median =1), while the mean number of type (b) errors was 4.44 (± .17 [SE], median = 4)\(^4\). In other words, participants were far more likely to include a barrier card in their list of concerns but answer with a neutral or negative response in the questionnaire than they were to answer with a positive response in the questionnaire but fail to include this barrier in their list of concerns\(^5\).

\(^4\) The frequency of type (b) errors, which may be due to underreporting barriers in the verbal questionnaire, led to an overall agreement rate between the barriers card sort and questionnaire of 73%, and a relatively low Cohen’s kappa of .3184.

\(^5\) This suggests that the card sort might actually be a more comprehensive and inclusive way to assess barriers of concern to respondents than a formal verbal questionnaire. Lifetime behavioral and risk data for GSMS indicates that this may be true for some of the items carrying a higher stigma, while it is not true for other items that carry a weaker social stigma. For example, life time reports of unwanted pregnancies, bad peers, and criminal convictions (all of which carry a significant local stigma) show a stronger relationship to the more anonymous card sort responses, while life time reports of high school dropouts and major life events (both of which carry a weaker local stigma) show a stronger relationship with questionnaire responses.
Test-retest reliability (n=18)

Sample characteristics

To assess the test-retest reliability of the life course inventory measure, 18 of our 350 respondents also completed a shortened form of the measure (excluding the preliminary demographics) within 6-15 days of performing the original life course inventory (minimum time span = 6 days, maximum = 15, mean = 10.94 ± .64 [SE] days). Eleven of the test-retest participants were Cherokee and seven were Anglo, with 13 females and five males. Respondent age ranged from 20 to 24, with a mean of 21.67 ± .40 [SE] years. Three interviewers collected the original and retest life course inventory data, two female and one male. All possible combinations of interviewers are represented in the test-retest study. Thirteen of the retest interviews were conducted in the same location as the original interview, and five were conducted in different locations.

Overview, types of data

The LTI-Y produces three types of data: 1. card rankings (difficulty, impact, etc.); 2. dichotomous data (i.e. exclusion dimension, dichotomous status items); 3. non-ranked, non-dichotomous responses (i.e. Goodman ladder, projected life span, Likert-scaled status items). Each data type requires different statistics to estimate test-retest reliability. For ranked data involving a constrained number of cards (1), test-retest reliability will be reported using Spearman’s rho. Although this statistic is insensitive to mean changes, these are not of issue in the ranked data using constrained sets of cards, as the mean is always identical. For dichotomous responses (2), statistics will be reported using the kappa statistic, which is particularly suited for reliability estimates of binary data. Finally, other variables of a more continuous and independent nature (i.e. non dichotomous, unranked data) (3) require the use of the intraclass correlation coefficient (ICC). ICC (1,1) was used in all cases because it
represents the most conservative measure of test-retest reliability that involves the fewest assumptions about sample and rater characteristics, and operates on the strictest definition of reliability.

(1) Ranked data

Ranked data include the importance dimension (milestones, social affordances, material goods), as well as the dimensions of concern (barriers), difficulty (milestones), impact (barriers), and relevance (barriers). In the case of the importance dimension (and the concern dimension for barriers), only the items that remained after the exclusion procedure were ranked. As different participants retained different cards (and different numbers of cards), the resultant incomplete data matrix and decreased number of observations made it difficult to examine individual item test-retest reliability. This difficulty was resolved by stacking and combining observations across participants and items (this same strategy was used for all ranked data). Table 4 displays the results of test-retest reliability for the all ranked dimensions, using Spearman’s rho. In all cases except average American milestones, the reported probability of independence between test and retest conditions was 0% (≤.0001).

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**Insert Table 4 about here**

As can be seen in Table 4, ranked data for the self achieved higher test-retest reliability than ranked data for average Americans. Indeed, this pattern runs throughout most of the test-retest reliability analyses. The other-self difference is predictable when one considers that responses concerning average Americans rely on abstract projection, whereas those concerning self depend on (likely more stable) internal priorities.
(2) Dichotomous data

Most of the dichotomous data produced by the LTI-Y indicate whether a card was included or excluded in participants’ minimal models (exclusion dimension). Some items had very low variance (i.e. were almost always included or almost always excluded). As a result, item-by-item analyses suffer from artificial inflation and deflation of correlation coefficients, and the most meaningful way to examine test-retest reliability for exclusion is by combining observations across items and participants. Table 5 shows Cohen’s kappa test-retest reliability for the exclusion dimension, broken down by life course domain and level of data collection (self vs. average American). In most cases, Cohen’s kappa was 0.5 or above, and the percent of identical answers between test and retest conditions was 80% or above (chance agreement is 50%). Participant current status for life course milestones and material goods was also coded dichotomously (yes/no); Cohen’s kappa test-retest reliability estimates exceeded 0.75 for each (see Table 5).

Insert Table 5 about here

(3) Independent non-dichotomous data

Portions of the LTI-Y elicited responses that were non-dichotomous and relatively independent of each other. These included participant status on life course barriers and social affordances (independent Likert-scaled questions, each with five response options), estimates of the minimum, ideal, and maximum ages for life course milestones (integers between 1 and 100), projected lifespan (independent scale with nine options), and the Goodman ladder (independent scales with ten response options). Intraclass correlation coefficients were all acceptable to high (see Table 6), with the exception of future projected SES on the Goodman
ladder (.1057). However, the difference between current and projected future status (a measure of expected future advancement) did show a strong ICC (.6693).

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**Insert Table 6 about here**

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**Test-retest, multivariate models**

The statistical analyses reported above combined observations across items and participants, which ignore inter-correlation of individual participants’ responses. To control for this effect, a multivariate logistic regression repeated measures analysis, with participant as repeated variable, was performed for binary exclusion data (participants’ individual decisions whether to include a particular card for milestones, social affordances, and material goods), testing the ability of the original “test” interview to predict results on the retest interview (6-15 days later) (Table 7). This type of analysis also allows a multivariate analysis of test-retest reliability that takes into account covariates such as participant age, time elapsed between test and retest interviews, and gender of participant.

Parameter estimates of the test data predicting retest responses generally were high. The parameter estimates in Table 7 represent log-odds ratios; when converted to real odds ratios, they range from 20-40. “COVAR” refers to any covariates that were retained in the model. In the case of social affordances, greater time elapsed between the test and retest was associated with less consistency, while older participants showed more consistent responses on the exclusion dimension for self ratings of milestones. Finally, (and counter intuitively), participants with different locations between the test and retest interviews showed higher response consistency for material goods. Overall, just as indicated by Cohen’s kappa (Table 5), exclusion data for the self showed higher consistency than exclusion responses for average Americans. The small size of the test-retest dataset limits interpretability of specific
findings. However, the close concordance between these repeated-measures analyses and reliability estimates obtained by simple combination of observations suggests that the reliability coefficients obtained for other domains of data are also valid.

Conclusions

The Life Trajectory Interview extends the empirical reach of collaborative efforts among psychiatrists, epidemiologists, and social scientists. It represents one of the first attempts to link quantitative developmental epidemiology with qualitatively grounded data on individual models of life course construction and content. Indeed, to the best of our knowledge, this is the first attempt to collect detailed data on life course models (rather than goals or motivations (Eccles and Wigfield, 2002)) with such a large population sample. As such, performance of the measure in test-retest reliability and scale consistency analyses was adequate to very good. Indeed, the degree of reliability is notable, given the sample are youth in the midst of the challenging transition to adulthood. Consistently higher test-retest reliability of responses regarding the self than those regarding average Americans suggests that participants have more stable concepts of personal priorities than they do of the broader social world. Generally, the level of test-retest reliability shown in the sample indicates that participants do hold stable concepts of their trajectories through the life span (life trajectory models, or “LTM’s”).

The LTI-Y was designed for use with an adolescent / young adult population, and could easily be applied in a variety of settings with participants below the age of 25. However, it is important to keep in mind that this interview was developed primarily with Anglo and Native American (Cherokee) respondents living in a rural area of the South.
Application with other ethnic/cultural groups, and/or in highly urban settings, might best be preceded by an investigatory pilot stage, whereby age, gender, and ethnicity-matched respondents outside the target sample are asked for general feedback about the interview, as well as items (or even domains) that may be missing or irrelevant. Currently, there are plans to develop the LTI-C (child life trajectory interview) for use with urban youth between the ages of 8-13, and an LTI-A (adult life trajectory interview) could easily be developed. The LTI also has the potential to be adapted to any international setting, and the use of icons instead of words would allow it to be applied with less literate populations as well.

Advantages of the LTI-Y are several. For one, the LTI-Y evaluates the translational gap between life goals or models and their attainment in the youth to adult transition. As the first comprehensive life course interview to probe both cognitive models of the life course and life course statuses, it gauges the degree of fit between internalized goals and actual achievement. Previous work has shown that status incongruity between internalized norms and actual circumstances is associated with increased risk for depression and hypertension (Dressler, 1991). Second, the measure assesses the congruence of personal goals and priorities with individual understanding of cultural norms. Divergence between endorsed personal goals and understood social norms may indicate deviance or pathology, as in the case of antisocial personality disorder (Cairns and Cairns, 2000). It may also be protective, by adjusting personal norms to the realities of individual circumstances, or by rejecting social ideals that may be harmful to vulnerable subpopulations (ideals of thinness in adolescent girls (Harkness and Super, 2000)). By estimating convergence, the LTI-Y generates data to probe such issues.

The translational zone characterized by the LTI-Y (norm-to-actual, personal vs normative) lies at the intersection of group and individual-level processes (Adolph, Eppler, and Gibson, 1993). As such, it addresses an important empirical gap and supports
investigation of long-standing questions about the impact of prior, current, and perceived future circumstances or disadvantages on life achievement or derailment. For example, economic disparity in this already relatively economically depressed area has been linked to mental health risk for both Cherokee and Anglos (Costello, 1997; Costello, Farmer, and Angold, 1999; Costello, Compton, Erkanli, and Angold, 2001). Alleviation of poverty furthermore led to reductions in pathology (Costello, Compton, Keeler, and Angold, 2003).

Part of the goal of the LTI-Y was to identify how, when, and even “why” poverty leads to psychopathology, as well as to pathways by which reduction of poverty exerts its effects. In addition, the LTI-Y probes multiple dimensions (milestone, material and social content) and dynamics (barriers, affordances) comprising models of the life course, while previous measures have addressed one (or a few) cognitive dimensions of goals. Moreover, the use of constrained choice (exclusion of all items that can be “done without”) not only elicits priorities but also reflects real world necessity, yet constrained choice rarely has been used to study life goals. Finally, development of the LTI-Y through a community-based iterative process enhances its ecological validity and increases its potential to reflect everyday thinking.

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Ethnographic life history interviews (n = 22)

Focus groups (N = 16 / n = 60)

Generate items, extract and refine domains

Pilot card sort interviews (n = 149)

Extract and test dimensions, finalize domains and items

Final card sort measure / life course inventory (n = 350)

Local life course perspectives and vocabulary, range of life course options

13 months

18 months
<table>
<thead>
<tr>
<th>Table 1. Cardsort sequence (approximate total time, 50 minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Life course milestones (n=12): items considered “most important to achieve in life”</strong></td>
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<tr>
<td><strong>2. Life course barriers (n=20): items considered most likely to block life course progress</strong></td>
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<tr>
<td><strong>3. Social affordances (n=20): items considered most important for “being happy and satisfied” in life</strong></td>
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<tr>
<td><strong>4. Material goods (n=15): items considered most important for “the good life”</strong></td>
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</tbody>
</table>
Table 2. LTI-Y sample characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Anglo</th>
<th>Cherokee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>205</td>
<td>143</td>
</tr>
<tr>
<td>Gender</td>
<td>178 female</td>
<td>172 male</td>
</tr>
<tr>
<td>Family stability</td>
<td>198 stable</td>
<td>150 unstable (≥ 1 transition)</td>
</tr>
<tr>
<td>Early poverty</td>
<td>199 non-poor</td>
<td>149 poor (≥ 2 years)</td>
</tr>
</tbody>
</table>

Total sample size = 350, and includes one African American female and one African American male (not shown in this chart).
### Table 3. Scale consistency (Cronbach’s alpha / * = KR20, dichotomous data)

<table>
<thead>
<tr>
<th></th>
<th>Status</th>
<th>Exclusion</th>
<th>n (items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestones</td>
<td>.6150</td>
<td>.6016</td>
<td>12</td>
</tr>
<tr>
<td>Barriers</td>
<td>.7832*</td>
<td>.7629</td>
<td>20</td>
</tr>
<tr>
<td>Social affordances</td>
<td>.7231*</td>
<td>.7247</td>
<td>20</td>
</tr>
<tr>
<td>Material goods</td>
<td>.6005</td>
<td>.7355</td>
<td>15</td>
</tr>
<tr>
<td>All domains</td>
<td>.8474*</td>
<td>---</td>
<td>67</td>
</tr>
<tr>
<td>Likert-scaled only (social affordances, life course barriers)</td>
<td>.8302*</td>
<td>---</td>
<td>40</td>
</tr>
<tr>
<td>Dichotomous only (milestones, material goods)</td>
<td>.7101</td>
<td>---</td>
<td>27</td>
</tr>
<tr>
<td>All positive domains (milestones, social affordances, material goods)</td>
<td>.7874</td>
<td>.8238</td>
<td>47</td>
</tr>
</tbody>
</table>

* = Cronbach’s alpha (otherwise KR20).
--- = irrelevant or incompatible combination of items.

1 Cronbach’s alpha analyses for social affordances status automatically inverted one social affordance, “hanging out / partying,” suggesting that this item functioned more like a life course barrier than an actual social affordance.

2 When all items were combined, the milestone “have and raise kids” was automatically inverted (as were all life course barriers and the social affordance “hanging out / partying”). This suggests that having children in one’s late teens or early twenties is actually a marker of low general life achievement.
Table 4. Test-retest reliability, (1) ranked data

<table>
<thead>
<tr>
<th></th>
<th>Spearman’s rho</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestones (importance):</td>
<td></td>
</tr>
<tr>
<td>self</td>
<td>.6130</td>
</tr>
<tr>
<td>average American</td>
<td>-.0001</td>
</tr>
<tr>
<td>Milestones (difficulty):</td>
<td></td>
</tr>
<tr>
<td>self</td>
<td>.7409</td>
</tr>
<tr>
<td>average American</td>
<td>.5859</td>
</tr>
<tr>
<td>Social affordances</td>
<td></td>
</tr>
<tr>
<td>(importance): self</td>
<td>.5221</td>
</tr>
<tr>
<td>(importance): AA</td>
<td>.3736</td>
</tr>
<tr>
<td>Material goods</td>
<td></td>
</tr>
<tr>
<td>(importance): self</td>
<td>.7344</td>
</tr>
<tr>
<td>(importance): average American</td>
<td>.4139</td>
</tr>
<tr>
<td>Barriers (concern):</td>
<td></td>
</tr>
<tr>
<td>self</td>
<td>.4100</td>
</tr>
<tr>
<td>Barriers (impact):</td>
<td></td>
</tr>
<tr>
<td>average American</td>
<td>.5147</td>
</tr>
<tr>
<td>Barriers (relevance):</td>
<td></td>
</tr>
<tr>
<td>average American</td>
<td>.5348</td>
</tr>
</tbody>
</table>

The above statistics assess only the stability of the relative ranking of cards. In most cases (except for importance), the relative and absolute ranking of cards is identical.
<table>
<thead>
<tr>
<th>Category</th>
<th>Cohen’s kappa ± S.E.</th>
<th>% agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status, milestones</td>
<td>.7725 ± .0678</td>
<td>88.89</td>
</tr>
<tr>
<td>Status, material goods</td>
<td>.7698 ± .0608</td>
<td>88.52</td>
</tr>
<tr>
<td>Exclusion, milestones: self</td>
<td>.4578 ± .0674</td>
<td>81.48</td>
</tr>
<tr>
<td>Exclusion, milestones: average American</td>
<td>.5735 ± .0670</td>
<td>81.48</td>
</tr>
<tr>
<td>Exclusion, social affordances: self</td>
<td>.6235 ± .0520</td>
<td>85.00</td>
</tr>
<tr>
<td>Exclusion, social affordances: AA</td>
<td>.4086 ± .0603</td>
<td>78.89</td>
</tr>
<tr>
<td>Exclusion, material goods: self</td>
<td>.4018 ± .0609</td>
<td>74.44</td>
</tr>
<tr>
<td>Exclusion, material goods: average American</td>
<td>.3760 ± .0594</td>
<td>80.74</td>
</tr>
</tbody>
</table>
Table 6. Test-retest reliability, (3) independent non-dichotomous data

<table>
<thead>
<tr>
<th>Status, life course barriers</th>
<th>ICC (1,1) ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status, social affordances</td>
<td>.5572 ± .2150</td>
</tr>
<tr>
<td>Ages (min)</td>
<td>.5531 ± .1595</td>
</tr>
<tr>
<td>Ages (ideal)</td>
<td>.5566 ± .1177</td>
</tr>
<tr>
<td>Ages (max)</td>
<td>.5239 ± .1148</td>
</tr>
<tr>
<td>Projected lifespan</td>
<td>.8426 ± .1222</td>
</tr>
<tr>
<td>Goodman: current SES</td>
<td>.5315 ± .2583</td>
</tr>
<tr>
<td>Goodman: future SES</td>
<td>.1057 ± .2665</td>
</tr>
<tr>
<td>Goodman: “climb” (future – current)</td>
<td>.6693 ± .2350</td>
</tr>
<tr>
<td>Goodman: parental SES</td>
<td>.5198 ± .2648</td>
</tr>
<tr>
<td>Goodman: popularity / centrality</td>
<td>.4474 ± .2771</td>
</tr>
</tbody>
</table>
Table 7. Test-retest reliability, repeated measures

<table>
<thead>
<tr>
<th></th>
<th>Log-odds ± SE</th>
<th>95% C.I.</th>
<th>Z</th>
<th>p</th>
<th>ICC</th>
<th>COVAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestones, self</td>
<td>3.5474 ± 0.5669</td>
<td>(2.4362, 4.6586)</td>
<td>6.26</td>
<td>&lt; .0001</td>
<td>.1199</td>
<td>Age</td>
</tr>
<tr>
<td>Milestones, AA</td>
<td>3.1870 ± 0.5082</td>
<td>(2.1909, 4.1831)</td>
<td>6.27</td>
<td>&lt; .0001</td>
<td>.0289</td>
<td>--</td>
</tr>
<tr>
<td>Social, self</td>
<td>3.6228 ± 0.4396</td>
<td>(2.7612, 4.4845)</td>
<td>8.24</td>
<td>&lt; .0001</td>
<td>.0068</td>
<td>Time</td>
</tr>
<tr>
<td>Social, AA</td>
<td>2.2199 ± 0.3984</td>
<td>(1.4391, 3.0008)</td>
<td>5.57</td>
<td>&lt; .0001</td>
<td>-.0146</td>
<td>Time</td>
</tr>
<tr>
<td>Material, self</td>
<td>2.2342 ± 0.7289</td>
<td>(0.8055, 3.6628)</td>
<td>3.07</td>
<td>.0022</td>
<td>.2509</td>
<td>Location</td>
</tr>
<tr>
<td>Material, AA</td>
<td>2.8780 ± 0.4351</td>
<td>(2.0252, 3.7308)</td>
<td>6.61</td>
<td>&lt; .0001</td>
<td>.0852</td>
<td>Location</td>
</tr>
</tbody>
</table>
Appendix 1. LTI-Y items by domain (verbatim from cards)

Milestones
- Driver’s license
- Get college, technical, or vocational degree
- Get first car or truck
- Get first house (or trailer, modular home, etc.)
- Get permanent job / career
- Have and raise kids
- Have financial security (savings, investments, etc.)
- High school graduation or GED
- Marriage or live together with someone
- Move out of parents’ house
- Settle down / be more responsible
- Start first job

Barriers
- Addiction (drugs, alcohol, etc.)
- Always going for the thrill / impulsive
- Bad experiences in school (with teachers, students, counselors, etc.)
- Being angry or overly emotional
- Community or family holds you back / discourages you
- Depression / anxiety
- Drop out of high school or college
- Fights / conflict / tension with friends, family, or community
- Get married or settle down too early
- Hang with the wrong crowd
- Have kids too early
- Jail / prison / trouble with the law
- Lack of jobs & lack of educational opportunities / resources
- Major loss: divorce, illness, heartbreak, accident, death of friend / family
- No motivation / Lazy
- Overspend / go into debt
- Partying too much
- Pressure to help family or friends
- Stress / time pressure
- Things that hold you back from college (homesick, traveling, money, stress, etc.)

Social affordances
- Being honest, responsible, polite
- Close / best friends
- Common sense / think for yourself
- Community connections and support
- Determination, motivation, drive
- Fun / excitement
- Good / supportive / attractive husband/wife
- Government (or Tribal) programs
- Hanging out with friends / partying
- Having a passion or focus in life
- Health, fitness, and stress relief
- High self-esteem / secure in yourself
- Higher education
- Lots of life experiences
- Money and finances
- Plan ahead and have goals
- Respect your elders / know your cultural and family roots
- Status and power in the community
- Strong family support and family time
- Support from church, faith, and prayer
Material Goods

- 4-wheelers, boats, jet-skis, bikes, etc. (recreational vehicles)
- Big/nice house (pool, yard, deck, etc.)
- Computer with internet connection
- Dogs / pets
- Expensive sports / hobby equipment (athletic, music, hunting, etc.)
- Fancy car or truck (with modifications & accessories)
- Good cell phone and calling plan
- Home entertainment center (big screen, surround sound, etc.)
- Investments (stocks, bonds, savings)
- Jewelry (diamonds, gold, silver, etc.)
- Lake or beach house (vacation home)
- Nice clothes (Tommy, Aeropostale, Gap CarHartt, etc.)
- Own a business
- Own property / have good land
- Vacation and travel
References


