Group Decision Making with Uncertain Outcomes: Unpacking Child-Parent Choice of the High School Track

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Motivation

Tracking and Uncertainty. *"If someone studies humanities in a general high school, but after 5 years he no longer wishes to go to university, what can he do? And after studying art in a general high school? Because, when one is 14, he makes a choice, and thinks that perhaps he will go to college afterwards... But, after 5 years, he might change his mind. And, if he is fed up with school, then he can go to work"* [if he has attended a technical or vocational school] (A brother) (Istituto IARD, 2001)

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Family Decision Making. *"As for her high school track, she decided what to study. She chose the type of school, but only after talking together. Her father, for instance, preferred a different* [type of] *school and, perhaps, I hoped for yet a different one. But she made her own choice in the end, after a series of discussions we had together"* (A mother) (Istituto IARD, 2001)

"My mom wanted me to attend the artistic high school, my father the accounting school, and I chose the education curriculum, instead. So, I gave them both the sack" (A girl) (Istituto IARD, 2001)

Child-Parent Track Choice

- Uncertainty and Determinants of Choice
  - Taste for subjects, study effort, getting good grades, being with one's friends... As well as opportunities and choices after graduation
  - As academic achievement and monetary returns may not be the only relevant or most valued outcomes (Zafar (*forthcoming*), Wiswall and Zafar (2011), Arcidiacono et Al. (2012), Jacob and Lefgren (2007))
- Family decision making
  - The decision making unit is not obvious
  - Likely heterogenous roles of adolescent children and parents across families and decisions (Lundberg et Al. (2009a, 2009b))
- Heterogenous family rules
  - Parents may try to "create children in their own image," to improve their children's condition (Saez and Zilibotti (2008), and references therein), or let their children be (choose)...
  - New literature on parenting and child-parent interactions (e.g., papers in the parent-child games section)

Research Questions

(Q1) Uncertainty and Mechanisms: What are the main determinants of high-school track choice?

- Outcomes valued by children and parents in the choice
- Beliefs vs. utility values of outcomes

(Q2) *Family* decision making: What are child's and parent's roles in the choice?

- Child's choice preference vs. parent's choice preference... In fact, child's beliefs and utility values vs. parent's beliefs and utility values...
- How do they enter the decision process and determine observed choices?

(Q3) Implications: Does distinguishing matter for choice prediction and policy analysis?

General Identification Problem

- Typical data: Distribution of actual choices
- Problem: Multiple configurations of
  - individual decision makers' beliefs (about future outcomes),
  - individual decision makers' utilities (of future outcomes),
  - group's decision rule (decision participants' "roles")

  are observationally equivalent...

  $\Rightarrow$ **General question:** How to separate them? $\Leftarrow$
- Context: Any real-life decision with uncertain outcomes and multiple decision makers, but *no strategic interaction*

Simple Framework

- Choice is static, discrete, and with "subjective risk"
- Families are child-parent dyads
- Choice preferences of individual family members are represented by Bayesian subjective expected utilities (Savage, 1954)
  - Linear
  - With separable beliefs and utility valuations
- Multilateral family decision making is modeled as Bayesian group decision making (Hylland and Zeckhauser, 1979)
  - Pooling of family members' beliefs (Dietrich, 2010)
  - Or aggregation of family members' expected utilities (Keeney and Nau, 2011)

A 2×2×2×2 Example

- 2 *potential* decision makers: $i \in \{$child (c), parent (p)$\}$
- 2 alternatives: $j \in \{$Michelangelo (M), Galileo (G)$\}$
- 2 binary outcomes:
  1. outcome 1: child's taste for subjects
     $\Rightarrow P_{ij1} = i$'s *subjective probability* that the child will enjoy curriculum j's core subjects
  2. outcome 2: flexibility in the future study vs. work choice
     $\Rightarrow P_{ij2} = i$'s *subjective probability* that the child will face a wide range of education and work opportunities after graduation from j
- 2 family decision rules:
  $\Gamma^k \in \{$child unilaterally, child and parent jointly$\}$

A 2×2×2×2 Example (Continued)

- True ("*objective*") child- and curriculum-specific probabilities

P(c likes M)= 95 P(c faces a flex college-work choice after M)= 30

P(c likes G)= 70 P(c faces a flex college-work choice after G)= 90

- Child unilaterally

$$\max_{j \in \{M,G\}} SEU_{cj} = P_{cj1} \cdot \Delta u_1^c + P_{cj2} \cdot \Delta u_2^c$$

- Child and parent jointly

$$\max_{j \in \{M,G\}} \phi^c \cdot SEU_{cj} + (1 - \phi^c) \cdot SEU_{pj}$$

Scenarios Compatible with Choice of M

(1) Child unilaterally: "utility driven"

$$SEU_{cM} = P_{cM1} \cdot \Delta u_1^c + P_{cM2} \cdot \Delta u_2^c = 95 \cdot 10 + 30 \cdot 0$$
$$\geq \quad SEU_{cG} = P_{cG1} \cdot \Delta u_1^c + P_{cG2} \cdot \Delta u_2^c = 70 \cdot 10 + 90 \cdot 0$$

(2) Child unilaterally: "beliefs driven"

$$SEU_{cM} = P_{cM1} \cdot \Delta u_1^c + P_{cM2} \cdot \Delta u_2^c = 95 \cdot 5 + 90 \cdot 5$$
$$\geq \quad SEU_{cG} = P_{cG1} \cdot \Delta u_1^c + P_{cG2} \cdot \Delta u_2^c = 70 \cdot 5 + 90 \cdot 5$$

(3) Child and parent jointly: "rule driven"

$$\phi^c \cdot SEU_{cM} + (1 - \phi^c) \cdot SEU_{pM} = 1/3\,[95 \cdot 5 + 30 \cdot 5] + 2/3\,[95 \cdot 5 + 90 \cdot 5]$$
$$\geq \quad \phi^c \cdot SEU_{cG} + (1 - \phi^c) \cdot SEU_{pG} = 1/3\,[70 \cdot 5 + 90 \cdot 5] + 2/3\,[70 \cdot 5 + 90 \cdot 5]$$

Research Questions (Restated)

(Q1) What are the main determinants of high-school track choice?

$\Rightarrow$ "utility weights"

(Q2) What are child and parent roles in the choice?

$\Rightarrow$ "decision weights"

(Q3) Does distinguishing matter for prediction and policy analysis?

$\Rightarrow$ counterfactual effects of changes in family members' beliefs

A Survey in Northern Italy

- Population: 9th graders enrolled for the first time in any public HS of the Verona Municipality in Sept. 2007 and their parents (little over 4,000)
  - Age of tracking 14
  - Retrospective survey during first week of high school
  - Choice-based sampling
  - 1 child questionnaire and 1 parent questionnaire

- Choice set: 10 main curricula offered in the municipality
  - Tracks (general, technical, vocational) + curricula (core subjects)
  - Separate curricula (in different schools)
  - Open enrollment (and mostly public)

- Samples: 1,029 students (enrolled for the first time) and 608 parents
  - Participating students ($\approx$ 100%) filled their questionnaire in class during 1 school hour, assisted by an instructor
  - Parents took their questionnaire at home and returned through the school within 7-10 days

- ▸ Institutional Details, ▸ Design Choices

Key Data

- Outcome of family process
  - (D1) Actual choices, or *revealed preferences* (RP)
- "Ingredients"
  - (D2) Individual beliefs: Child's and parent's *probabilistic expectations* about several during-high-school and post-graduation outcomes, elicited on a 0-100 percent chance scale (▸ Quest, ▸ Outcomes)
  - (D3) Individual choice preferences: Child's and parent's curriculum rankings, or *stated preferences* (SP) (▸ Quest)
  - (D4) Self-reported family decision rules (▸ Quest):
    - **(R1)** Child unilaterally
    - **(R2)** Child with parental input ("after listening")
    - **(R3)** Child and parent jointly
- Additional information
  - (D5) Orientation suggestions from JH school teachers
  - (D6) Child and family background characteristics

Some Data Features on Family Decision Making

Family Rule[A] (Sample)	% Of Families Where Observed Choice Same As: Both Child and Par SPs	Child SP Only	Parent SP Only	Other Curriculum	Sample Size
All (Matched)	54.13	33.03	5.87	6.97	565 (100%)
R1 (Matched)	51.78	40.17	1.79	5.36	112 (19.82%)
R2 (Matched)	52.56	35.81	6.51	5.12	215 (38.05%)
R3 (Matched)	57.98	28.99	5.04	7.98[B]	238 (42.13%)
All (All)	86.09		13.91		971 (100%)
R1 (All)	88.82		11.18		170 (17.51%)

A–NOTE: Family rule reported by child

B–NOTE: 5% of R3 families made "dominated choices," given child's and parent's SPs

▸ Within-Family Knowledge

Decision Process

Stage 1: Time before the final decision–*Taken as given*

(1a) Do child and parent systematically develop a common decision framework?

NO: After (1b), go to (R1)
YES: After (1b), go to (R2) or (R3)

(1b) Child and parent individually evaluate each alternative

Stage 2: Final decision–*According to one of three family decision rules*

(R1) Child unilaterally: Based on his/her individual choice preferences, i.e., beliefs and utilities of outcomes

(R2) Child with parental input: Child and parent pool their opinions, outcome by outcome, into "family beliefs." Choice is based on family beliefs and child's individual utilities of outcomes

(R3) Child and parent jointly: Based on a family expected utility aggregating individual members' choice preferences

Stage 2: Family Rules

(R1) Child unilaterally

$$\max_{j \in \mathcal{J}} P_{cj1} \cdot \Delta u_1^c + P_{cj2} \cdot \Delta u_2^c$$

$\Rightarrow$ Standard SEU

(R2) Child with parental input ("after listening")

$$\max_{j \in \mathcal{J}} [(1 - \omega_1^p) \cdot P_{cj1} + \omega_1^p \cdot P_{pj1}] \cdot \Delta u_1^c + [(1 - \omega_2^p) \cdot P_{cj2} + \omega_2^p \cdot P_{pj2}] \cdot \Delta u_2^c$$

$\Rightarrow$ Bayesian linear pooling (Dietrich, 2010)

(R3) Child and parent jointly

$$\max_{j \in \mathcal{J}} \phi^c \cdot [P_{cj1} \cdot \Delta u_1^c + P_{cj2} \cdot \Delta u_2^c] + (1 - \phi^c) \cdot [P_{pj1} \cdot \Delta u_1^p + P_{pj2} \cdot \Delta u_2^p]$$

$\Rightarrow$ Bayesian *efficient* group decision (Keeney and Nau, 2011)

▸ Assumptions, ▸ More Literature

Unilateral Decision Making

(and "Representative DM")

- Identification
  - Given observed actual choices (RP)/stated-preferred alternatives (SP), utility parameters are identified by heterogeneous beliefs across decision makers/families
- Empirical specifications
  1. Model with one data source ($t \in \{\text{RP}, \text{SP}\}$)

$$\max_{j \in \mathcal{J}} \Gamma_{fj}^{1} \equiv SEU_{cj}^{t,1} = \alpha_j^{t,1} + \sum_{n=1}^{N} P_{cjn} \cdot \Delta u_n^{c,t,1} + \varepsilon_{cj}^{t,1}, \text{ with } \varepsilon^{t,1} \text{ Type-I EV}$$

  2. SP-RP joint model

$$\begin{cases} \Gamma_{fj}^{1} \equiv SEU_{cj}^{RP,1} = \alpha_j^{RP,1} + \sum_{n=1}^{N} P_{cjn} \cdot \Delta u_n^{c,1} + \varepsilon_{fj}^{RP,1} \\ SEU_{cy}^{SP,1} = \alpha_y^{SP,1} + \sum_{n=1}^{N} P_{cyn} \cdot \Delta u_n^{c,1} + \varepsilon_{cy}^{SP,1} \end{cases}$$

- The SP/RP scale, $\mu^1 = \mu^{c,SP,1}/\mu^{RP,1} = \sqrt{Var(\varepsilon_{fj}^{RP,1})/Var(\varepsilon_{cy}^{SP,1})}$, is identified
- The relationship between $\varepsilon^{RP,1}$ and $\varepsilon^{SP,1}$ can be tested by: (i) $\alpha_j^{RP,1} = \alpha_j^{SP,1}$ for all j, and (ii) $\mu^1 = 1$

Multilateral Decision Making

- Identification (SP-RP framework)
  - Utility parameters are identified from SP data and heterogenous beliefs across children's (parents')
  - Decision parameters are identified by within-family differences in child and parent SPs relative to the observed family choice (RP)
  - The family decision rule is directly identified by survey information on family members' decision roles
- Empirical specifications
  - R2: Child with parental input

$$\begin{cases} \Gamma_{fj}^{2} = \alpha_{j}^{RP,2} + \sum_{n=1}^{N} \left[(1 - w_{n}^{p,2}) \cdot P_{cjn} + w_{n}^{p,2} \cdot P_{pjn} \right] \cdot \Delta u_{n}^{c,2} + \varepsilon_{fj}^{RP,2} \\ SEU_{cy}^{SP,2} = \alpha_{y}^{c,SP,2} + \sum_{n=1}^{N} P_{cyn} \cdot \Delta u_{n}^{c,2} + \varepsilon_{cy}^{SP,2} \\ SEU_{ph}^{SP,2} = \alpha_{h}^{p,SP,2} + \sum_{n=1}^{N} P_{phn} \cdot \Delta u_{n}^{p,2} + \varepsilon_{ph}^{SP,2} \end{cases}$$

  With $\varepsilon^{t,2}$ type-I extreme value, and scale $\mu^{2} = \mu^{c,SP,2} / \mu^{RP,2}$
  - R3: Child and parent jointly works similarly ▸ R3 Model

Estimation

- WESML estimator (Manski and Lerman, 1977)
  - Corrects for choice-based sampling
  - Requires knowledge of population choice probabilities

- Conditional logit
  - Assumes errors are i.i.d. type-I extreme value
  - Inertia dummies to account for state dependence of SP on RP
  - Accounting for serial correlation across data sources is not straightforward due to the "intercept-and-follow" type sampling structure (with choice-based interception) of SP (McFadden, 1996)

- Specification Tests
  - Nested specification LR tests of R1 against R2 and R3 (on the R1 sample)
  - Non-nested specification tests of R2 against R3 (on the R2 sample), and R3 against R2 (on the R3 sample) (Ben-Akiva and Lerman, 1985)

(Q1) Determinants of Curriculum Choice

- "Representative DM" benchmark ▸ Tables
  - Child's **taste for subjects** is the most valued outcome both across family members and data sources, but post-graduation outcomes have significant importance, too
  - Children's and parents' beliefs imply **similar utility ranking over outcomes based on RP, but not on SPs**
  - No particular importance of being in school with friends, except when based on children's SP, while "make parent(s) happy" is always significant
  - Suggestions by teachers have significant explanatory power above and beyond family members' expectations, particularly on RPs
  - **Children's expectations** have stronger explanatory power on RPs than parents' expectations
- Heterogenous family rules ▸ Tables
  - Child's **taste for subjects** is the most valued outcome across decision rules, whereas relative importance of **remaining outcomes** is heterogeneous across decision groups and between children and parents
  - Heterogeneity in utility parameters across decision rules is consistent with correlations between rules and background characteristics

(Q2) Child and Parent Roles

- R2: Weights on parent expectations ▸ Tables
  - Parental beliefs affect curriculum choice heterogeneously across outcomes (a model with **equal weights across outcomes is rejected**)
  - Children assign a greater weight on their parents' opinion (than on their own) about their academic achievement in high school, whereas the opposite is true for some of the post-graduation outcomes
- R3: Weights on child expected utility ▸ Tables
  - Decision parameters for families making a joint decision imply a **predominant parental influence**, with approx. weights $\{1/3, 2/3\}$ on child and parent expected utilities
  - A model with **outcome-specific weights is rejected** against one with a single weight, consistent with the Pareto principle
- Specification tests
  - Unit SP/RP scale and equal SP and RP constants cannot be rejected for R1, whereas the SP/RP scales are < 1 for R2 and R3
  - The data clearly distinguish between R1 and R2-R3, but not as well between R2 and R3

(Q3) Counterfactuals

How would curriculum enrollment respond...

1. (De)Sensitization
   - 1.1 To a 10-point increase in subjective prob. of child, parent, or both that the child would enjoy the core subjects of the general math curriculum?
   - 1.2 To a 10-point decrease in subjective prob. of child, parent, or both that the child would enjoy the core subjects of the art curriculum?
2. Education statistics
   - 2.1 If subjective prob. of child, parent, or both did coincide with the most recent statistics of high school graduation rates by curriculum?
   - 2.2 If subjective prob. of child, parent, or both did coincide with the most recent statistics of college enrollment by curriculum of graduation?
3. Curriculum standards and specialization
   - 3.1 If all children were guaranteed to obtain at least passing marks in all grades and the final diploma in all curricula?
   - 3.2 If access to college were prevented following graduation from vocational curricula?

(Q3) Counterfactuals (Continued) ▸ Tables

- A. Hypothetical "policies"
  - Different hypothetical policies imply sizeably different impacts on enrollment
  - E.g., a small increase in the chance of enjoying math, or that university access is anchored on one's high school track, yields large responses, as opposed to providing information on curriculum graduation rates or college enrollment for previous cohorts
- B. Policy targets and heterogeneous family rules
  - The representative DM benchmark and the heterogeneous rules model generate qualitatively similar but quantitatively different predictions
  - Identity of policy recipients seems to matter for enrollment response, consistent with recent findings in the literature (Dinkelman and Martinez, 2011)
  - Assuming parents as representative DMs leads to an overestimation of response to (de)sensitization campaigns. And publication of education statistics have a larger impact on children reporting unilateral decision making

Conclusions

- Paper
  - Family choice of the high school track with subjective risk and heterogeneous rules of child-parent decision making
  - Original combination of different types of data to recover family members' utility and decision parameters
- Implications
  - The economics of the family needs to provide a formal accommodation for adolescent decision making
  - The economics of education and human development need to take into account the channels through (and extent to) which parents affect children's education decisions
- New research
  - Current modeling and survey design feature substantial limitations (▸ Ass.). Future efforts should focus on selection into child-parent decision processes and interactions
  - A new data collection in Northern Italy just completed (joint with M. Cosconati et Al.), where families were followed multiple times during the decision process, and channels such as monetary incentives (strategic interaction) and parental constraints on children's choice sets measured

Italian Secondary Education

Return

- Structure of secondary education
  1. Tracks: general, technical, vocational
  2. Curricula: core subjects

- Age of tracking: 13-14 (at high school entry)

- Allocation mechanism: family choice (tracking "by family background")
  - Open enrollment (mostly public);
  - Separate curricula (in different schools)

- Aspects of tracking "by ability" via orientation in junior high school (based on child's performance in school)

- Flexible tracking: track switching is possible, as well as college enrollment after a 5-year diploma from any track

Design Choices

Return

- Beginning of school year
  - Not enough experimentation with chosen curriculum (and new information) for belief updating
  - Together with wording and sequencing of questions, should limit issues of cognitive dissonance/ex-post rationalization in SP (Rosenzweig and Wolpin (1993); Chen and Risen (2010), Zafar (2011), Arcidiacono et Al. (2012))
- Retrospective
  - Advantages: Observe actual choices (RP data) *and* able to elicit expectations and SP before the decision process all at once
  - Disadvantage: Relies on respondents' capability to unbiasedly report their expectations and choice preferences before the final decision
- Format: Paper-based, in-class for students and at home for parents to maximize participation
- Choice-based sampling: More economical than random sampling and natural given clustering of students in curricula

Expectation Question Example

Return

Try and think about your situation during the past school year, when you were still in 8th grade. What did you think would be YOUR percent chance of PASSING EACH GRADE on the FIRST TRY and finally GRADUATING from the following curricula, should you enroll in each one them?

Curriculum (either traditional or laboratory)	**Percent Chances**
Vocational - Commerce	
Vocational - Industrial	
Technical - Commerce or Social	
Technical - Industrial	
Technical - Surveyors	
Artistic Education	
General - Humanities	
General - Languages	
General - Learning or Social Sciences	
General - Math and Science	

Subjective Expectations I ▸ Return

Quality of Curriculum Choice While in High School

For *each* curriculum $j \in \mathcal{J}$, respondent i's P_{ij} that

- **Taste:** Child would enjoy the curriculum's core subjects
- **Effort:** Child would spend $\geq$ 2.5h per day studying or doing homework
- **Performance I:** Child would graduate in any length of time
- **Performance II:** Child would graduate in the regular time
- **Performance III:** Child would graduate in the regular time and with an yearly GPA $\geq$ 7.5
- **Peers:** Child would be in school with his/her best friend(s)
- **Parent(s):** Child would make his/her parent(s) happy (asked to child only)

if child were to choose j

Subjective Expectations II

Return

Possibility Set and Choices After High School

For *each* curriculum $j \in \mathcal{J}$, respondent i's P_{ij} that

- **College vs. Work:** This curriculum would provide the training needed for either some university field(s) or for work in some liked job(s)
- **College enrollment:** Child would enroll in college after graduating from high school
- **College fields:** This curriculum would enable him/her to choose among a wide range of fields in college
- **Liked jobs:** Child would find a liked job after graduating from high school

if child were to choose j

- Questions about **expected earnings** at age 30 with a high school diploma from each curriculum and with a college degree received low response rates, even among parents

SP Question

Return

Try and think about your situation during the past school year, when you were still in 8th grade. Please, RANK the following curricula from the one YOU like BEST to the one you like the LEAST for yourself, considering the criteria YOU considered important for choosing among them. Start by assigning 1 to YOUR FAVORITE curriculum, then proceed by increments of 1 till YOUR LEAST preferred one. The same number cannot be assigned to two different schools.

School (either traditional or laboratory)	**Rank**
Vocational - Commerce	
Vocational - Industrial	
Technical - Commerce or Social	
Technical - Industrial	
Technical - Surveyors	
Artistic Education	
General - Humanities	
General - Languages	
General - Learning or Social Sciences	
General - Math and Science	

Decision Rule Question

Return

(A) We realized pretty soon that in our family we had the SAME IDEA	◯
(B) We DISCUSSED within our family till we reached a COMMON DECISION based on some COMPROMISE	◯
ONLY ONE PERSON took the final decision, AFTER receiving INFORMATION from the others and LISTENING to their OPINIONS	
(C) Myself	◯
(D) My father	◯
(E) My mother	◯
(F) Other person, specify:	◯
ONLY ONE PERSON made the final decision, WITHOUT discussing or exchanging OPINIONS with others	
(G) Myself	◯
(H) My father	◯
(I) My mother	◯
(L) Other person, specify:	◯

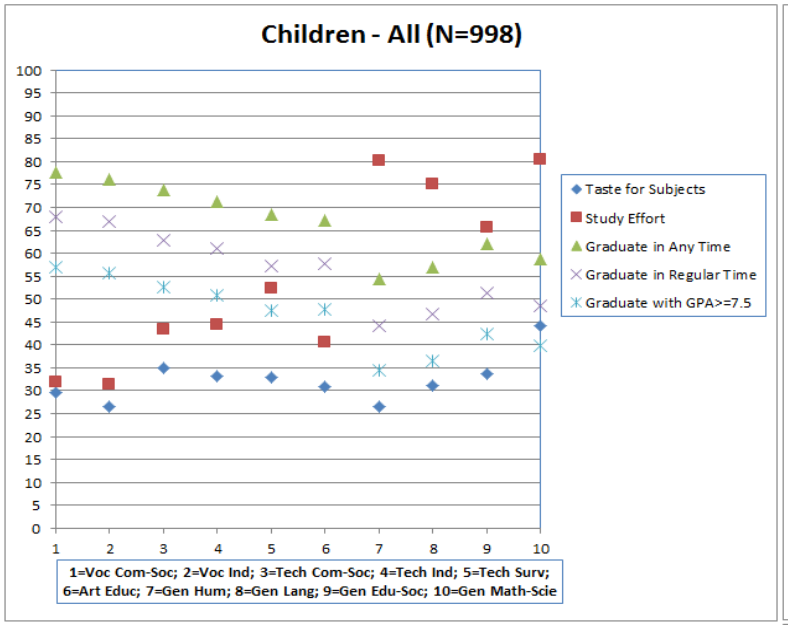
Child's and parent's knowledge of each other's choice preferences

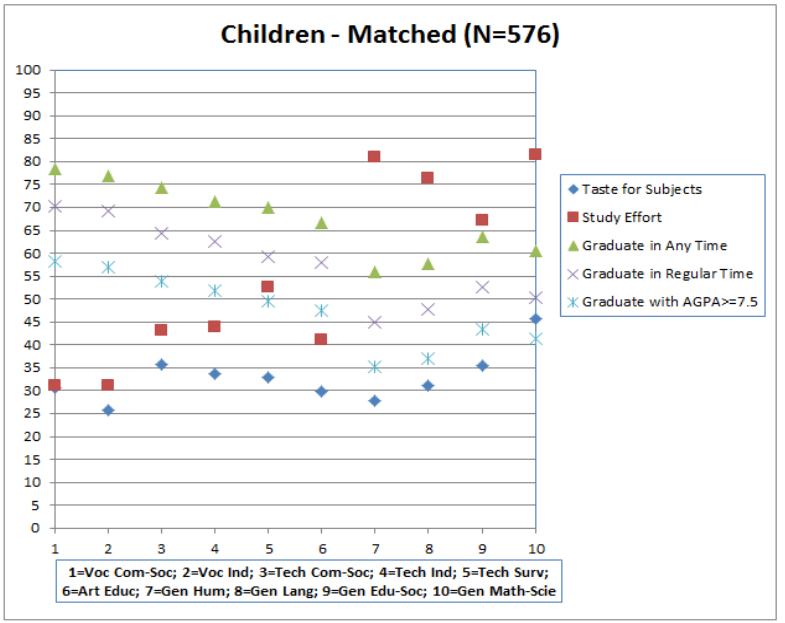
Return

Knowledge of Other's Choice Preference	Family Rule[A] R1	R2	R3
Child reports his parent's preferred track correctly	41.90%[B]	39.25%	45.61%
Parent reports her child's preferred track correctly	48.71%[B]	60.34%	63.13%
Child says he doesn't know his parent's preferred track/ doesn't respond	31.82%[C]	28.51%	13.85%
Parent says she doesn't know her child's preferred track/ doesn't respond	18.14%[C]	12.68%	14.23%
Sample size	81	215	238

Matched sample. Weighted data. "*A*": Family rule reported by child. "*B*" are likely UB and "*C*" LB of the population fraction due to high non-participation of R1 parents

Fig.1: Avg. beliefs about taste, effort, performance





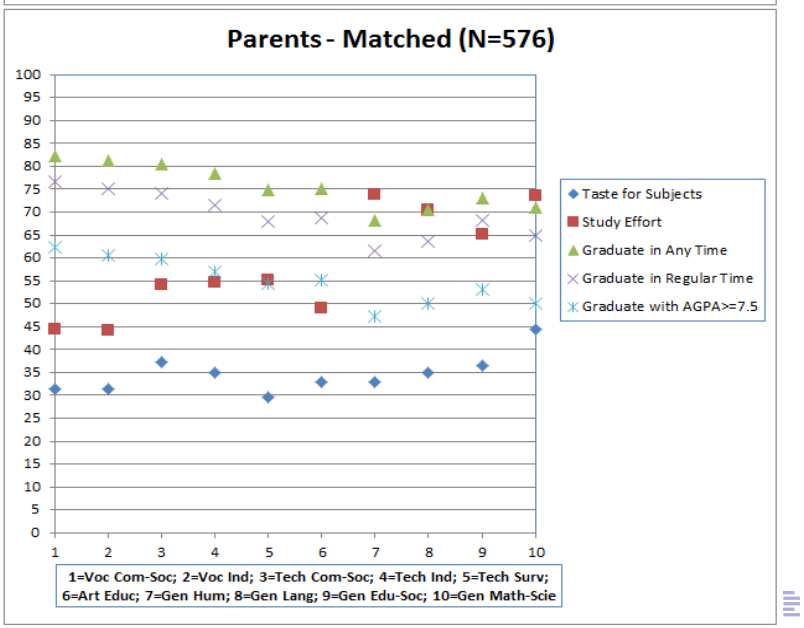
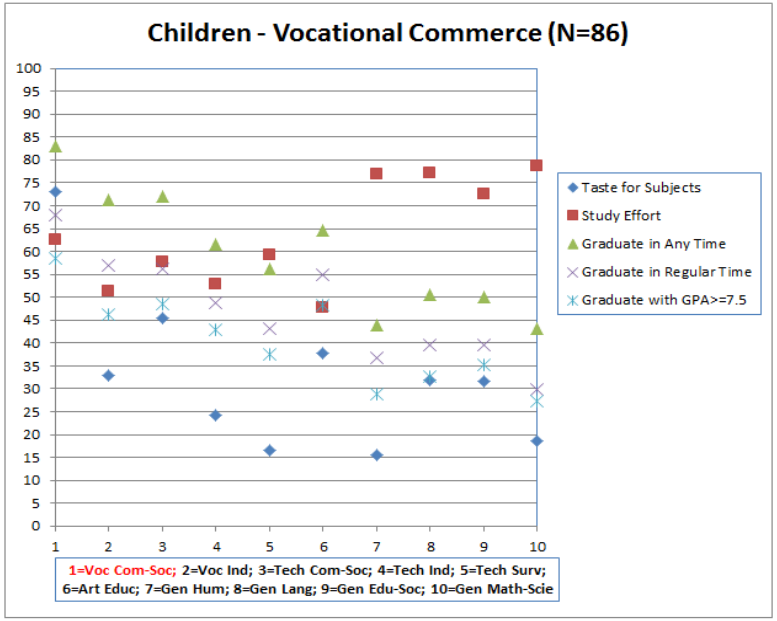
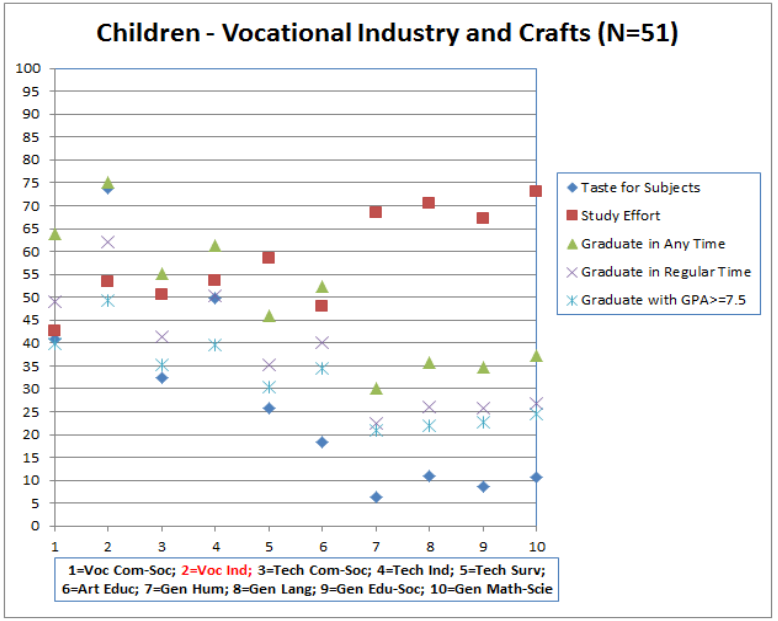


Fig.2: Avg. beliefs in the vocational sample

Return





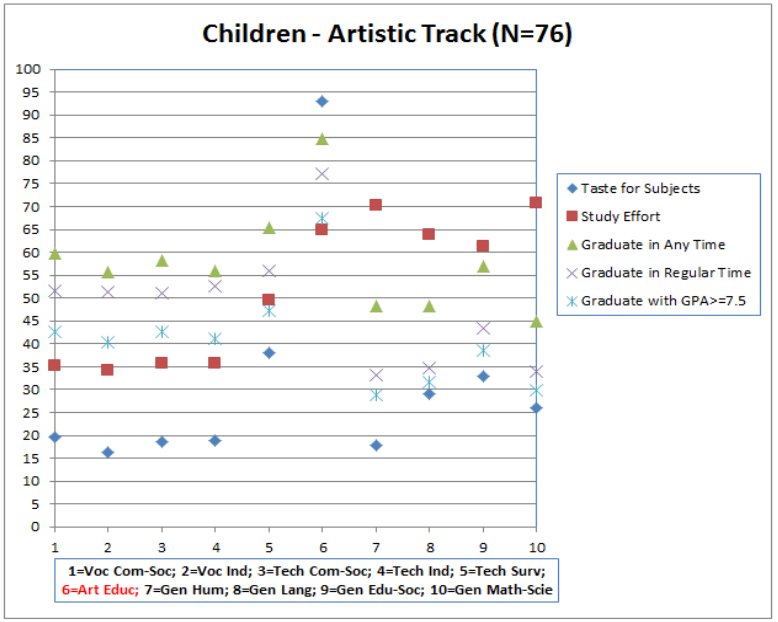
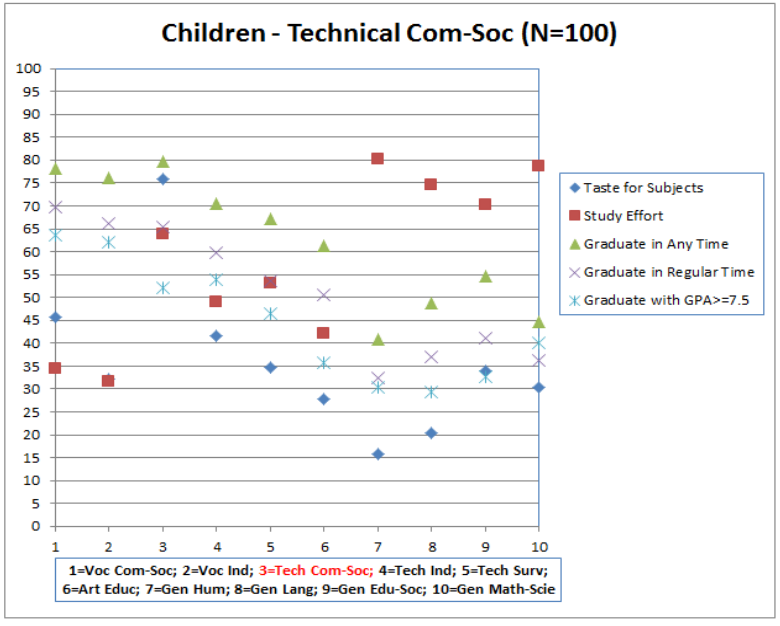
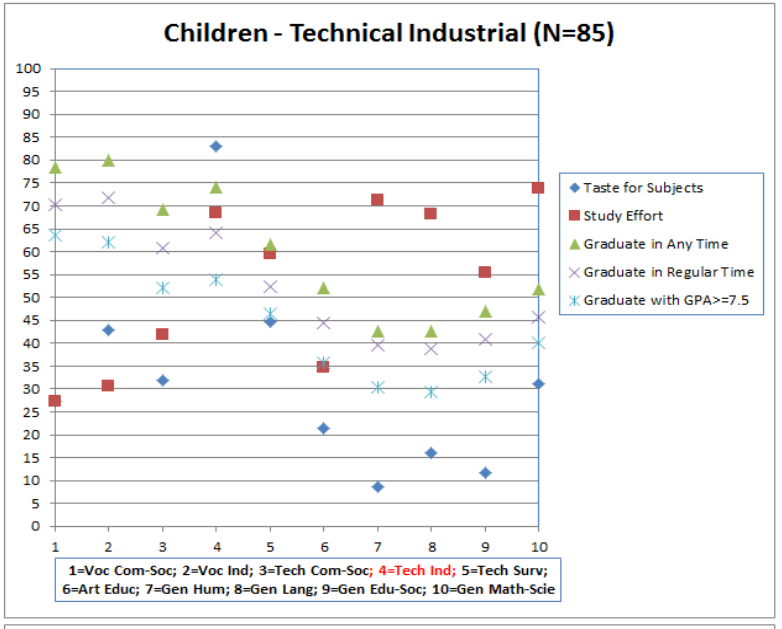


Fig.3: Avg. beliefs in the technical sample

Return





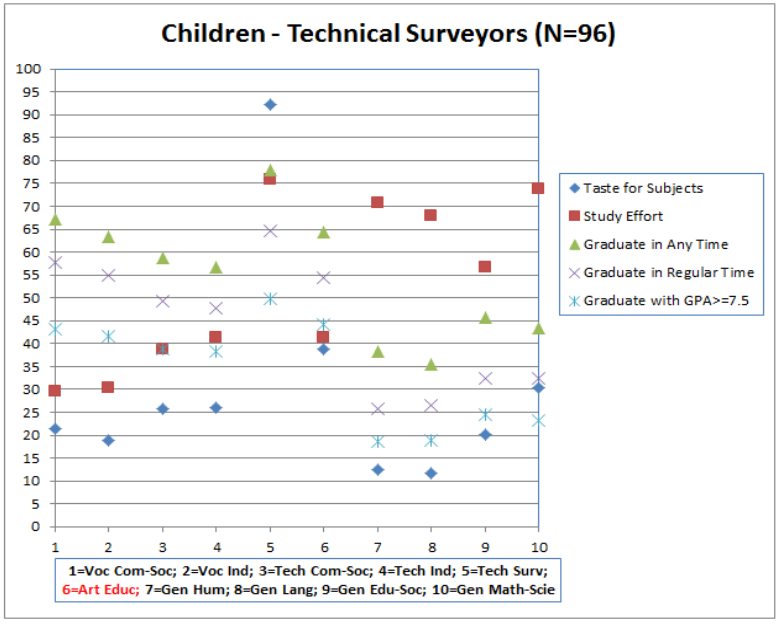
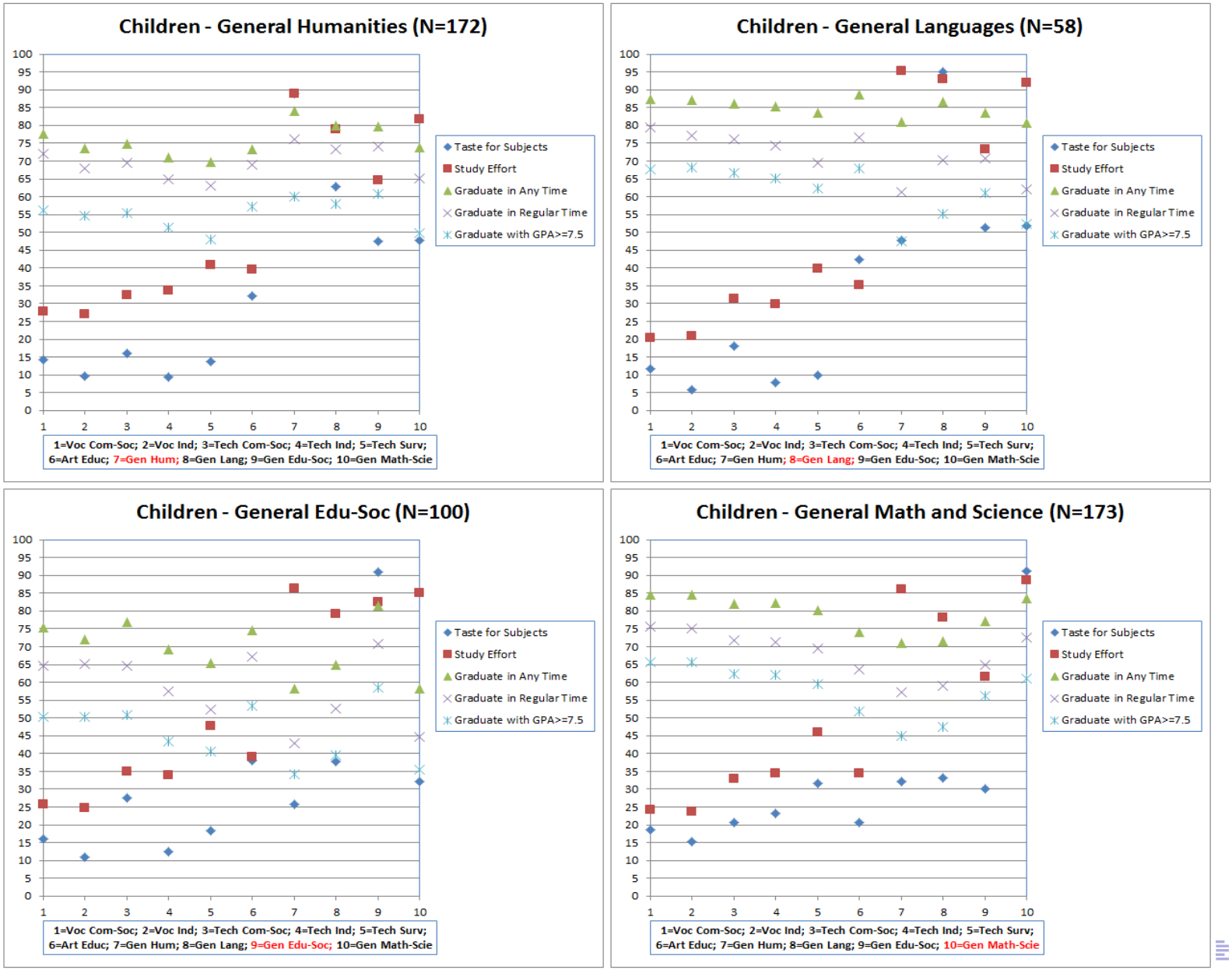


Fig.4: Avg. beliefs in the general sample

Return



Assumptions ReturnS2, ReturnC

1. Dyadic families (for data collection)
2. Individual or cooperative-type decision rules (no strategic interaction or constrained choice set)
3. Separability of curriculum choice and other family choices
   - Selection of family decision rule, curriculum choice, and school choice hierarchical
   - Exogeneity of family decision rule wrt family members' choice preferences (focus on stage 2, taking family decision rule as given)
4. Homogenous ("universal") choice set
5. Exogeneity of decision makers' beliefs wrt choice preferences, and subjective risk
   - Imperfect information model of randomness in which errors do not affect decision making (e.g., unaware of errors, no risk aversion, no differential information across alternatives)
6. Outcome-dependent utility with separable beliefs and utility valuations
7. Separable and binary uncertain outcomes (mostly for data collection)

Links with Literatures ▸ ReturnS2

- Cultural transmission (Saez-Marti and Zilibotti, 2008)
  - Non-paternalistic features. Children and parents share the common goal of choosing the curriculum that suits the child best, accounting for both near- and later-future choice consequences (same objective function). With this very purpose, parents may try to affect children's current choices (and, thus, future paths) via the channel of beliefs (R2), or both beliefs and utilities (R3)
  - Paternalistic features. Parental role in the choice is based on parents' own beliefs and utilities, which may differ from children's (as in Bisin and Verdier (2001)'s "imperfect parental empathy")
- Efficient group (household) behavior (Chiappori and Ekeland, 2009)
  - I exploit information on family members' decision roles to specify heterogenous rules of child-parent decision making, as opposed to relying uniquely on the assumption of Pareto efficiency
  - I focus on the aspect of subjective risk/uncertainty characterizing curriculum choice within a Bayesian framework, and do not address important issues of consumption and saving under uncertainty, such as risk sharing

Child and Parent Make a Joint Decision

Return

$$\begin{cases} \Gamma_{fj}^{3} = \alpha_{j}^{RP,3} + \phi^{c,3} \sum_{n=1}^{N} \left[P_{cjn} \cdot \Delta u_{n}^{c,3} \right] + (1 - \phi^{c,3}) \left[\sum_{n=1}^{N} P_{pjn} \cdot \Delta u_{n}^{p,3} \right] + \varepsilon_{fj}^{RP,3} \\ SEU_{cy}^{SP,3} = \alpha_{y}^{c,SP,3} + \sum_{n=1}^{N} P_{cyn} \cdot \Delta u_{n}^{c,3} + \varepsilon_{cj}^{SP,3} \\ SEU_{ph}^{SP,3} = \alpha_{h}^{c,SP,3} + \sum_{n=1}^{N} P_{phn} \cdot \Delta u_{n}^{p,3} + \varepsilon_{ph}^{SP,3} \end{cases}$$

With $\varepsilon^{t,3}$ type-I extreme value, and scale $\mu^{3} = \mu^{c,SP,3}/\mu^{RP,3} = \mu^{p,SP,3}/\mu^{RP,3}$

"Unitary Model" with RP Data

All

Return

Outcomes	Child's Expectations		Parent's Expectations	
	(1)	(2)	(3)	(4)
Like Subjects	(1) 5.58***	5.75***	(1) 8.14***	7.45***
Avg. Daily Homework $\geq$ 2.5h	0.91**	0.58	0.97	0.89
Graduate in Regular Time	(3) 1.59***	1.45***	(3) 1.68**	1.68*
In School with Friend(s)	0.11	−0.05	0.69	0.69
Flexible College-Work Choice	0.96***	1.21***	0.87*	0.99*
Attend College	0.92**	1.22**	0.70	1.14
Flexible College Field Choice	(2) 2.11***	2.19***	(2) 2.64***	1.94***
Liked Job after Graduation	(5) 1.05***	0.98***	(4) 1.18***	1.16**
Parent Happy	(3) 1.74***	1.74***	—	—
JHS Suggestion	—	(3) 1.49***	—	(2) 1.90***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-612.2726	-429.4309	-455.4374	-379.2716
Adjusted LR Index	0.726	0.773	0.651	0.686
Sample Size	998	857	588	550

***: significant at 1%, **: significant at 5%, *: significant at 10%

"Unitary Model" with RP Data Matched

Return

Variables	Child's Expectations		Parent's Expectations	
	(1)	(2)	(3)	(4)
Like Subjects	(1) 5.64***	5.40***	(1) 8.10***	7.44***
Avg. Daily Homework $\geq$ 2.5h	0.71	0.41	0.96	0.87
Graduate in Regular Time	(3) 2.30***	1.98***	(3) 1.58*	1.54*
In School with Friend(s)	0.02	−0.13	0.71*	0.70
Flexible the College-Work Choice	(5) 1.49***	1.65***	0.89**	1.03*
Attend College	0.90	0.52	0.70	1.13
Flexible College Field Choice	(2) 3.27***	3.45***	(2) 2.59***	1.87**
Liked Job after Graduation	(6) 1.13***	1.02**	(4) 1.19**	1.14**
Parent Happy	(3) 2.19***	2.01**	—	—
JHS Suggestion	—	(5) 1.43***	—	(2) 1.91***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-326.4765	-271.9569	-449.7248	-373.1916
Adjusted LR Index	0.740	0.765	0.648	0.684
Sample Size	576	537	576	537

***: significant at 1%, **: significant at 5%, *: significant at 10%

Children's and Parents' Preferences from SP Data

All

Return

Outcomes	Child's Expectations		Parent's Expectations	
	(1)	(2)	(3)	(4)
Like Subjects	(1) 6.71***	6.89***	(1) 4.08***	3.79***
Avg. Daily Homework $\geq$ 2.5h	0.64	0.32	−0.21	−0.20
Graduate in Regular Time	(5) 1.54***	1.25**	−0.12	−0.18
In School with Friend(s)	0.49**	0.52**	0.09	−0.02
Flexible College-Work Choice	0.55	0.42	(4) 1.05***	1.13***
Attend College	(4) 1.95***	1.57***	0.37	0.39
Flexible College Field Choice	(2) 2.29***	2.15***	(4) 1.29***	1.22***
Liked Job after Graduation	(2) 2.30***	2.26***	(2) 1.87***	1.94***
Parent Happy	(5) 1.57***	1.32***	—	—
JHS Suggestion	—	(7) 0.31**	—	(5) 0.64***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-503.288	-426.189	-709.581	-646.16
Adjusted LR Index	0.767	0.769	0.433	0.447
Sample Size	971	836	557	522

***: significant at 1%, **: significant at 5%, *: significant at 10%

Children's and Parents' Preferences from SP Data Matched

Return

Variables	Child's Expectations		Parent's Expectations	
	(1)	(2)	(3)	(4)
Like Subjects	(1) 6.64***	6.70***	(1) 4.06***	3.78***
Avg. Daily Homework $\geq$ 2.5h	0.08	−0.14	−0.19	−0.17
Graduate in Regular Time	1.08*	0.85	−0.19	−0.24
In School with Friend(s)	0.61*	0.64**	0.09	−0.01
Flexible the College-Work Choice	0.51	0.52	(4) 0.97***	1.04***
Attend College	1.16*	0.87	0.37	0.39
Flexible College Field Choice	(2) 2.63***	2.37***	(3) 1.26***	1.20**
Liked Job after Graduation	(2) 2.57***	2.61***	(2) 1.90***	1.97***
Parent Happy	(4) 1.46***	1.38**	—	—
JHS Suggestion	—	(6) 0.27	—	(5) 0.63***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-294.457	-271.808	-696.524	-633.629
Adjusted LR Index	0.751	0.752	0.431	0.445
Sample Size	545	510	545	510

***: significant at 1%, **: significant at 5%, *: significant at 10%

"Child Chooses Unilaterally"

Return

Variables	RP Model		SP Model		SP-RP Model	
	(1)	(2)	(3)	(4)	(5)	(6)
Like Subjects	(1) 6.46***	6.40***	(1) 5.65***	5.69***	(1) 6.55***	6.57***
Daily Homework $\geq$ 2.5h	−1.20	−2.80***	−0.06	−0.96	−0.73**	−2.06*
Graduate in Regular Time	(4) 2.91***	2.60**	1.91*	1.70	(4) 2.59***	2.21**
In School with Friend(s)	0.48	0.53	0.31	0.24	0.42	0.48
Flex. College-Work Choice	1.55*	2.89***	0.43	0.92	1.14	2.08**
Attend College	(2) 3.95***	5.24***	(3) 2.53**	2.37**	(2) 3.49***	4.02**
Flex. Coll. Field Choice RP	0.32	−1.22***	–	–	0.42	−1.08
Flex. Coll. Field Choice SP	–	–	(3) 2.41**	1.46	(4) 2.87**	1.65
Liked Job after Grad. RP	0.88	1.47*	–	–	0.87	1.23
Liked after Grad. Job SP	–	–	(2) 3.13***	3.55***	(2) 3.55***	4.14***
Parent Happy	(3) 3.23***	3.52***	(3) 2.77**	3.38**	(2) 3.22***	3.65***
JHS Suggestion RP	–	(7) 2.32***	–	–	–	(5) 2.26***
JHS Suggestion SP	–	–	–	(5) 1.14***	–	(7) 1.50**
SP/RP Scale	–	–	–	–	0.845***	0.813***
Constants	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-85.159	-56.210	-88.230	-69.626	-174.317	-127.823
Adjusted LR Index	0.736	0.773	0.729	0.733	0.739	0.759
Sample Size	170	144	170	144	170	144

***: significant at 1%, **:significant at 5%, *: significant at 10%

"Child Chooses After Listening to the Parent"

Child's Preferences

Return

Variables	(1)	(2)	(3)	(4)
Like Subjects	(1) 12.43^{***}	12.20^{***}	(1) 15.38^{***}	16.50^{***}
Avg. Daily Homework $\geq$ 2.5h	0.90	1.72	0.30	0.33
Graduate in Regular Time	(4) 2.94^{*}	4.06^{*}	(3) 3.52^{*}	6.58^{**}
In School with Friend(s)	0.68	0.54	0.86	1.03
Flexible College-Work Choice	(4) 2.66^{**}	3.60^{***}	(3) 3.67^{*}	6.00^{**}
Attend College	-0.08	0.36	-1.42	-2.54
Flexible College Field Choice	(2)7.88^{***}	6.97^{***}	(2) 9.12^{***}	8.43^{***}
Liked Job after Graduation	(3) 3.25^{***}	3.55^{***}	(3) 3.58^{**}	2.10
Parent Happy	(4) 2.53	2.32^{**}	(3) 3.43^{**}	3.66^{**}
JHS Suggestion RP	—	—	3.08	3.30
JHS Suggestion SP	—	—	0.35^{**}	-4.33^{**}
RP Dummies	No	Yes	No	Yes
SP/RP Scale	0.586^{***}	0.348^{***}	0.488^{***}	0.272^{***}
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-156.909	-116.437	-128.487	-93.125
Adjusted LR Index	0.807	0.839	0.824	0.851
Sample Size	219		205	

***: significant at 1%, **:significant at 5%, *: significant at 10%

"Child Chooses After Listening to the Parent"

Parent's Preferences

Return

Variables	(1)	(2)	(3)	(4)
Like Subjects	(1) 4.07^{***}	2.76^{***}	4.02^{***}	2.96^{***}
Avg. Daily Homework $\geq$ 2.5h	-0.65	-0.80	-0.45	-0.48
Graduate in Regular Time	-0.32	-0.64	-0.39^{*}	-0.43
In School with Friend(s)	0.03	0.04	-0.15	-0.12
Flexible College-Work Choice	(3) 1.37^{**}	1.34^{**}	1.50^{***}	1.56^{***}
Attend College	0.20	-0.06	0.22	-0.16
Flexible College Field Choice	(3)1.56^{**}	1.55^{**}	1.52^{**}	1.47^{**}
Liked Job after Graduation	(2) 2.34^{***}	2.35^{***}	2.33^{***}	2.30^{***}
JHS Suggestion	—	—	(5) 0.42^{*}	0.02
RP Dummies	No	Yes	No	Yes
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-268.705	-244.848	-244.111	-221.891
Adjusted LR Index	0.433	0.461	0.445	0.471
Sample Size	219		205	

***: significant at 1%, **:significant at 5%, *: significant at 10%

"Child and Parent Make a Joint Decision"

Child's Preferences

Return

Variables	(1)	(2)	(1)	(2)
Like Subjects	(1) 12.13***	11.49***	(1) 13.58***	13.23***
Avg. Daily Homework $\geq$ 2.5h	1.86	2.30	1.60	2.04
Graduate in Regular Time	(3) 3.88**	3.81	3.10*	2.33
In School with Friend(s)	0.52	0.31	1.10	0.69
Flexible Work-College Choice	1.04	1.15	0.86	1.20
Attend College	2.88**	2.67*	2.71*	2.48
Flexible College Field Choice	(2) 5.49***	6.02*	(2) 5.18**	5.29**
Liked Job after Graduation	(3) 3.98***	4.15**	(2) 4.72**	5.91**
Parent Happy	(3) 3.56**	4.05*	(2) 4.18**	5.22**
JHS Suggestion RP	—	—	(5) 1.13***	1.15***
JHS Suggestion SP	—	—	−0.04	−2.61**
RP Dummies	No	Yes	No	Yes
SP/RP Scale	0.524***	0.329**	0.486***	0.280***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-501.9089	-445.5068	-457.8141	-407.4601
Adjusted LR Index	0.664	0.689	0.671	0.690
Sample Size	238		223	

***: significant at 1%, **: significant at 5%, *: significant at 10%

"Child and Parent Make a Joint Decision"

Parent's Preferences

Return

Variables	(1)	(2)	(3)	(4)
Like Subjects	(1) 8.46***	8.99***	(1) 7.97***	(1) 8.12***
Avg. Daily Homework $\geq$ 2.5h	(4) −1.31	−2.12	−1.23	−1.63
Graduate in Regular Time	2.35	3.32	3.18*	4.23**
In School with Friend(s)	−0.38	−0.94	−0.73	−1.25
Flexible Work-College Choice	(4) 2.20**	2.68**	2.15**	2.36**
Attend College	0.88	0.48	0.81	0.69
Flexible College Field Choice	(3) 2.96***	3.75**	(3) 2.96***	(3) 3.46***
Liked Job after Graduation	(2) 1.84**	1.70*	(2) 1.78**	(2) 1.58
JHS Suggestion SP	–	–	(3) 2.01***	2.06***
RP Dummies	No	Yes	No	Yes
SP/RP Scale	0.524***	0.329**	0.486***	0.329***
Constants	Yes	Yes	Yes	Yes
Log-likelihood	-501.9089	-445.5068	-457.8141	-407.4601
Adjusted LR Index	0.667	0.689	0.671	0.690
Sample Size	238		223	

***: significant at 1%, **: significant at 5%, *: significant at 10%

"Child Chooses After Listening to the Parent"

Weights on Parent Beliefs

Return

Variables	(1)	(2)	(3)	(4)	
Like Subjects	0.450^{***}	0.457^{***}	0.434^{***}	0.448^{***}	$\approx 0.5, \neq 0, \neq 1$
Avg. Daily Homework $\geq$ 2.5h	1.440	0.962	-0.984	-1.930	
Graduate in Regular Time	0.669	0.698^{*}	1.120^{**}	1.028^{***}	≥ 0.5
In School with Friend(s)	0.057	-0.474	0.710	0.386	
Flexible College-Work Choice	0.099	0.181	0.296	0.373	
Attend College	16.132	-1.919	1.131	0.702	
Flexible College Field Choice	0.249	0.187	0.229	0.204	≤ 0.5
Liked Job after Graduation	0.494^{**}	0.503^{*}	0.281	0.218	
Log-likelihood	-156.909	-116.437	-128.487	-93.125	
Adjusted LR Index	0.807	0.839	0.824	0.851	
Sample Size	219		205		

***: significant at 1%, **: significant at 5%, *: significant at 10%

"Child and Parent Make a Joint Decision"

Weight on Child Expected Utility

Return

	(1)	(2)	(3)	(4)
Decision Weight	0.357^{***}	0.370^{***}	0.307^{***}	0.311^{***}
Log-likelihood	-501.9089	-445.5068	-457.8141	-407.4601
Adjusted LR Index	0.667	0.689	0.671	0.690
Sample Size	238		223	

$\approx 1/3, \neq 0, \neq 0.5$

***: significant at 1%, **: significant at 5%, *: significant at 10%

Return

	Voc Comm ($j=1$)	Voc Ind ($j=2$)	Tech Comm ($j=3$)	Tech Ind ($j=4$)	Tech Surv ($j=5$)	Art Educ ($j=6$)	Gen Hum ($j=7$)	Gen Lan ($j=8$)	Gen Edu ($j=9$)	Gen Math ($j=10$)
Initial Predicted Probabilities of Choosing Curriculum j										
	7.64	7.42	17.71	12.44	6.80	4.23	9.43	4.01	7.88	22.44
% Change in Predicted Probabilities of Choosing Curriculum j Following										
Policy 1	**An Increase in Percent Chances that "Child Likes the Subjects" in General Math-Scie by 10**									
Unitary–Child	-1.29	-1.73	-1.38	-2.27	-3.97	-1.99	-8.40	-7.61	-3.78	+11.16
Unitary–Parent	-2.53	-3.05	-3.50	-5.04	-4.63	-3.47	-11.58	-12.36	-6.76	+18.93
R1–Child	-1.28	-0.84	-0.26	-1.76	-3.51	-2.01	-4.78	-1.58	-4.02	+7.04
R2–Child	-0.30	-0.14	-1.09	-3.64	-1.42	-0.20	-5.44	-3.93	-0.71	+6.74
R2–Parent	-0.23	-0.10	-0.83	-2.71	-1.02	-0.18	-4.17	-2.90	-0.50	+5.06
R2–C&P	-0.50	-0.24	-2.02	-6.95	-3.16	-0.28	-9.63	-7.99	-1.58	+12.73
R3–Child	-0.73	-0.54	-0.40	-0.76	-1.12	-2.93	-4.94	-7.33	-2.75	+6.41
R3–Parent	-0.94	-0.73	-0.55	-0.98	-1.43	-3.85	-6.61	-9.71	-3.67	+8.50
R3–C&P	-1.49	-1.34	-1.00	-1.68	-2.29	-6.62	-11.89	-17.20	-6.66	+15.03
Policy 2	**A Decrease in Percent Chances that "Child Likes the Subjects" in Artistic Educ by 10**									
Unitary–Child	+0.86	+0.41	+0.45	+0.21	+1.53	-13.77	+0.46	+1.20	+1.50	+0.29
Unitary–Parent	+0.88	+0.72	+0.57	+0.59	+1.79	-18.91	+1.17	+2.02	+0.92	+0.54
R1–Child	+0.48	+0.83	+0.17	+0.14	+0.95	-15.33	+0.93	+2.61	+2.24	+0.31
R2–Child	+0.01	+0.06	+0.06	-0.02	+0.13	-6.20	+1.80	+0.23	+0.80	-0.01
R2–Parent	+0.00	+0.06	+0.06	-0.03	+0.11	-4.70	+1.33	+0.16	+0.64	-0.01
R2–C&P	+0.01	+0.07	+0.07	-0.02	+0.19	-11.43	+3.58	+0.57	+1.21	-0.01
R3–Child	+0.12	+0.11	+0.12	+0.01	+0.72	-6.13	+0.31	+0.31	+0.18	+0.52
R3–Parent	+0.17	+0.12	+0.13	+0.02	+0.94	-7.86	+0.39	+0.43	+0.21	+0.67
R3–C&P	+0.37	+0.20	+0.20	+0.06	+1.51	-13.53	+0.66	+0.86	+0.40	+1.14

Return

	Voc Comm ($j=1$)	Voc Ind ($j=2$)	Tech Comm ($j=3$)	Tech Ind ($j=4$)	Tech Surv ($j=5$)	Art Educ ($j=6$)	Gen Hum ($j=7$)	Gen Lang ($j=8$)	Gen Edu ($j=9$)	Gen Math ($j=10$)
Initial Predicted Probabilities of Choosing Curriculum j										
	7.64	7.42	17.71	12.44	6.80	4.23	9.43	4.01	7.88	22.44
% Change in Predicted Probabilities of Choosing Curriculum j if										
Policy 3	**Individual Percent Chances that "Child Graduates in the Regular Time" Coincide with the Realized Freq. in a Previous Cohort for All Curricula**									
Unitary–Child	-2.15	-3.42	+0.35	-1.72	-4.09	-7.37	+4.03	+0.43	-0.65	+3.63
Unitary–Parent	-4.47	-5.23	+0.15	-3.83	-0.67	-5.11	+5.94	+2.62	-1.56	+4.00
R1–Child	-0.94	-6.32	+0.34	-4.09	-3.51	-9.81	+3.70	+4.12	-1.23	+5.46
R2–Child	-1.73	-0.17	-0.50	+0.38	+0.16	+0.41	-0.85	+0.12	+0.27	-0.23
R2–Parent	-4.30	-0.12	+1.06	-2.94	-2.23	-5.10	+3.93	+4.12	+0.64	+1.32
R2–C&P	-3.07	-0.32	+0.73	-2.39	-2.05	-4.32	+2.86	+4.30	+1.07	+0.99
R3–Child	-2.48	-2.88	+0.22	+1.47	-1.89	-3.39	+1.28	-2.63	+0.79	+1.68
R3–Parent	-5.74	-4.57	+0.09	+0.75	-1.19	-3.64	+2.86	-0.70	+1.80	+2.31
R3–C&P	-7.53	-6.94	+0.10	+1.87	-2.89	-7.21	+4.15	-3.14	+2.38	+3.96
Policy 5	**Everybody Is Guaranteed a Diploma in the Regular Time from Any Curriculum (I.e., Percent Chances that "Child Graduates in the Regular Time"=100 for All Curricula)**									
Unitary–Child	-2.35	-2.29	+0.57	+0.53	-2.63	-6.35	+1.62	+0.36	-0.59	+2.27
Unitary–Parent	-4.38	-3.78	+0.61	+0.63	+0.77	-3.66	+2.07	+2.30	-1.63	+1.66
R1–Child	-0.47	-5.11	-0.11	-0.57	-2.28	-7.40	+0.20	+2.20	-0.92	+4.19
R2–Child	+1.68	-0.15	-0.53	+0.08	+0.02	+0.19	-0.54	+0.08	+0.27	-0.07
R2–Parent	-4.25	-0.30	+1.42	+0.35	-1.01	-2.33	+0.74	+5.05	+0.88	-0.55
R2–C&P	-3.03	-0.50	+1.03	+0.47	-0.98	-1.94	+0.10	+5.13	+1.23	-0.60
R3–Child	-2.60	-2.65	+0.32	+2.43	-1.64	-2.52	+0.22	-2.12	+0.78	+1.15
R3–Parent	-6.00	-4.00	+0.35	+2.92	-0.56	-1.94	+0.54	+0.32	+1.74	+1.12
R3–C&P	-7.99	-6.16	+0.44	+5.06	-2.08	-4.47	+0.67	-1.52	+2.40	+2.23

Return

	Voc Comm ($j=1$)	Voc Ind ($j=2$)	Tech Comm ($j=3$)	Tech Ind ($j=4$)	Tech Surv ($j=5$)	Art Educ ($j=6$)	Gen Hum ($j=7$)	Gen Lang ($j=8$)	Gen Edu ($j=9$)	Gen Math ($j=10$)
Initial Predicted Probabilities of Choosing Curriculum j										
	7.64	7.42	17.71	12.44	6.80	4.23	9.43	4.01	7.88	22.44
% Change in Predicted Probabilities of Choosing Curriculum j if										
Policy 4										
Individual Percent Chances that "Child Attends College" Coincide with the Realized Freq. in a Previous Cohort for All Curricula										
Unitary–Child	-2.67	-11.17	+3.36	+0.64	-5.29	-5.89	+2.07	+0.98	+0.28	+3.17
Unitary–Parent	-5.69	-12.46	+2.96	-0.14	-3.23	-3.50	+3.15	+2.65	+1.59	+3.08
R1–Child	-10.68	-24.81	+5.88	+0.62	-20.15	-18.88	+13.43	+14.20	+4.47	+6.77
R2–Child	-0.39	-0.17	+0.28	-0.09	-0.74	-0.57	+0.23	+0.19	+0.23	+0.14
R2–Parent	+3.14	+1.19	-1.77	+1.90	+3.29	+3.90	-1.03	-1.27	-0.81	-1.91
R2–C&P	+2.79	+0.99	-1.52	+1.86	+2.54	+3.56	-0.88	-1.07	-0.55	-1.79
R3–Child	-1.70	-5.13	+2.11	+1.96	-1.10	-2.66	+0.61	-1.25	-1.62	+0.90
R3–Parent	-1.28	-3.16	+0.73	+0.23	-0.01	-1.79	+0.63	+0.22	+0.42	+0.66
R3–C&P	-3.04	-8.37	+2.92	+2.23	-1.11	-4.46	+1.19	-0.88	-1.33	+1.56
Policy 6										
Vocational Diplomas Do Not Give Access to College (I.e., Percent Chances that "Child Attends College," "Child Makes a Flexible College-Work Choice," and "Child Makes a Flexible College Field Choice" =0 for All Vocational Curricula)										
Unitary–Child	-63.20	-53.38	+23.53	+19.07	+5.30	+10.01	+2.08	+5.35	+4.46	+3.14
Unitary–Parent	-61.99	-56.56	+22.47	+20.70	+11.86	+6.91	+2.01	+4.44	+4.15	+2.61
R1–Child	-61.25	-40.16	+13.14	+15.31	+6.30	+13.30	+7.00	+7.65	+13.27	+1.89
R2–Child	-52.52	-31.16	+26.67	+ 8.79	+0.30	+4.96	+0.03	+5.69	-0.00	+0.21
R2–Parent	-17.38	-18.16	+6.50	+10.68	+0.22	-0.06	+0.02	+3.63	-0.00	+0.15
R2–C&P	-57.97	-60.86	+31.85	+20.60	+0.32	+10.15	+0.03	+5.71	+0.00	+0.26
R3–Child	-33.82	-23.40	+11.10	+11.84	+2.78	+0.70	+0.32	+0.47	+5.37	+0.85
R3–Parent	-44.97	-45.97	+17.58	+20.86	+5.14	+0.91	+0.49	+0.68	+5.51	+1.08
R3–C&P	-72.03	-61.61	+29.49	+25.74	+6.70	+1.13	+0.56	+0.89	+9.64	+1.33