

*Making Value
for Society*

Starter or Joiner, Market or Socially-Oriented: Predicting Career Choice among Undergraduate Engineering and Business Students

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Different Career Paths of Making Value for Society

Larry Page
Sergey Brin
Founded
Google
Computer
Science



Gary White
Founded
Water.org
Civil and
Environmental
Engineering

Mary Barra
CEO
General Motors
Electrical
Engineering



Catherine Leslie
Executive Director
Engineers Without
Borders
Civil Engineering

Student Career Decisions

Business Self-Efficacy	Starters	<p><i>"start my own business"</i></p> <p>Market Entrepreneur</p> <p><i>unadjusted n = 311 resampled n = 50</i></p>	<p><i>"start a non-profit organization"</i></p> <p>Social Entrepreneur</p> <p><i>unadjusted n = 22 resampled n = 50</i></p>
	Joiners	<p><i>"work within a for-profit organization/business"</i></p> <p>Market Value Provider</p> <p><i>unadjusted n = 360 resampled n = 50</i></p>	<p><i>"work for a non-profit organization"</i></p> <p>Social Service Provider</p> <p><i>unadjusted n = 61 resampled n = 50</i></p>
		Market Oriented	Social Oriented
		Career Outcome Expectation	

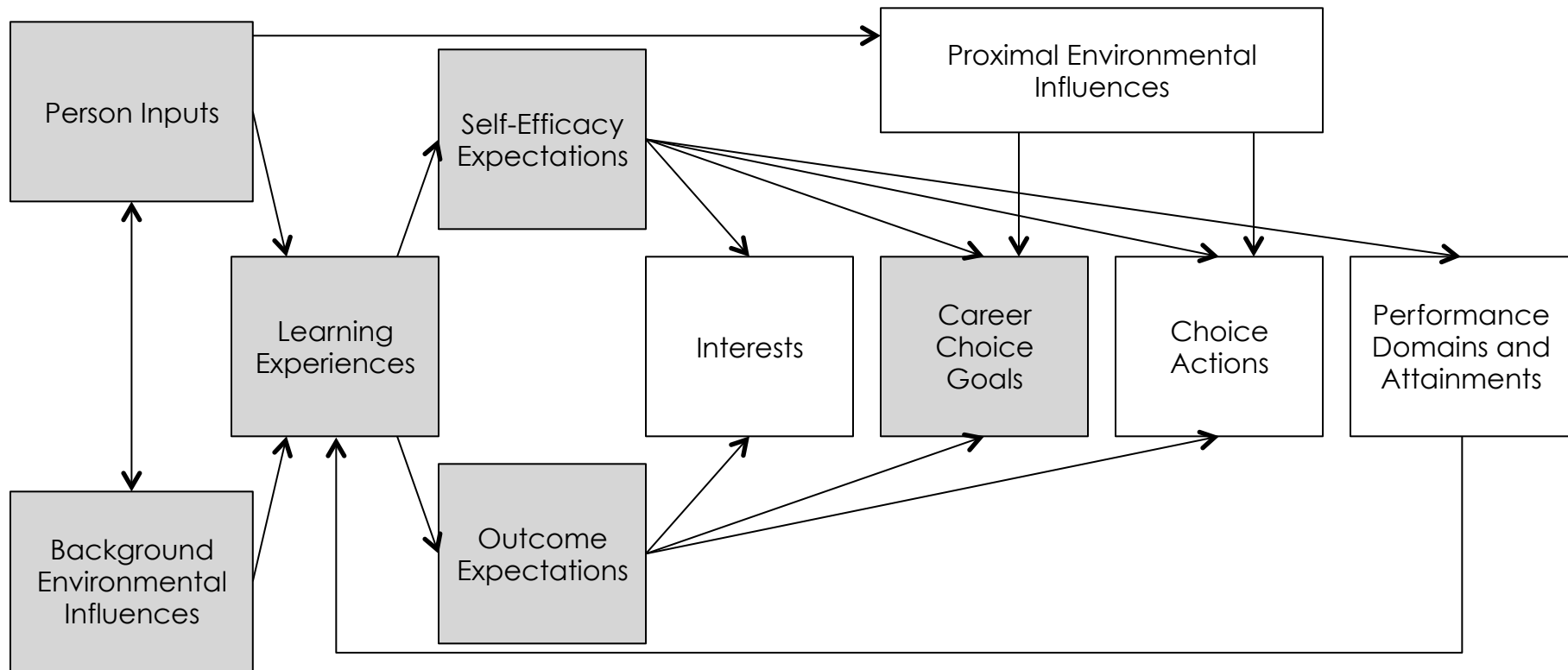
The Art of the Start: Starters and Joiners



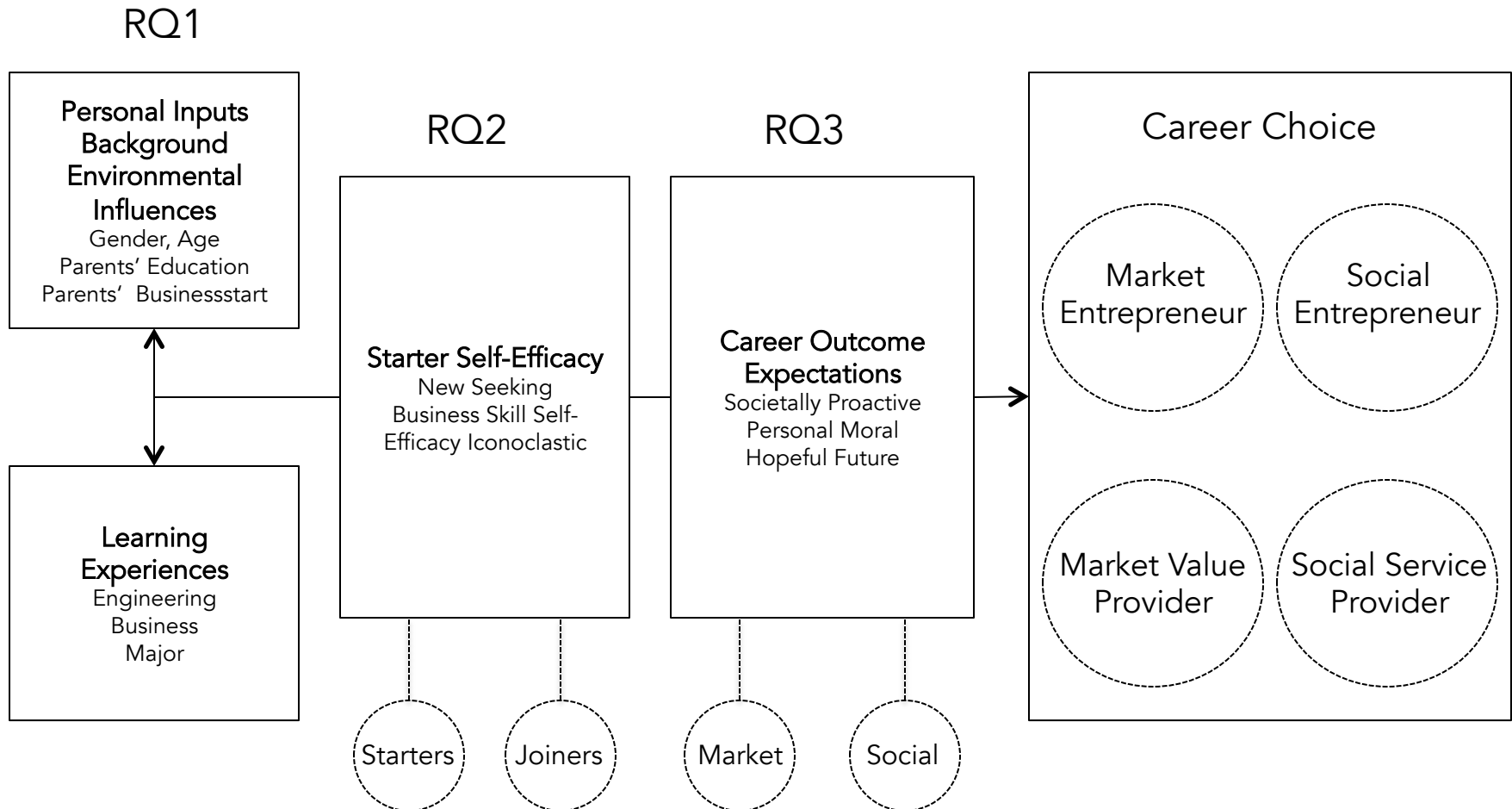
Career Outcome Expectations: Market or Social



Making a Career Choice: The Social Cognitive Career Theory



Starter, Joiner, Market, Social Theoretical Framework



Research Methods

- Data collection: Young Entrepreneurs Study (YES)
 - YES was designed to understand the development of entrepreneurial purpose, achievements, and character attributes among adolescents and young adults in the US
 - Mixed method longitudinal study
- Participants
 - N = 754 (46% female and 54% male)
 - Engineering (48%) and business (52%) undergraduate students
 - From 51 universities across the US

Research Methods

- Measures
 - 18 scales selected based on theoretical framework
 - Reliability: all Cronbach's alphas larger than 0.7
- Data analysis
 - Resampling using bootstrapping
 - Grouping of the factors: factor analysis
 - Comparing groups: t-tests with effect sizes (Cohen's ds)
 - Understand which factors are related to career choice: logistic regression

Research Questions

1. How do choices between starter-joiner and socially-market career goal outcomes differ between engineering and business students?
2. How do students who express a career interest in starting an organization (Starters) differ from students who would rather join an existing organization (Joiners)?
3. How do students with career expectations that are Socially Oriented (not-for-profit) differ from students who are Market Oriented (for-profit) in their career outcome goals?

Results

RQ 1 How do choices between starter-joiner and socially-market differ between engineering and business students?

Measures	Engineering Majors		Business Majors		Diff	t	p	d
	Mean	SD	Mean	SD				
Starters (% by Major)	35%		53%		-18%	4.92	<.0001	0.36
Socially Oriented (% by Major)	9%		13%		-4%	1.55	0.121	0.11
Entrepreneurial Intent	3.09	1.06	3.6	0.99	-0.51	6.79	<.0001	0.5
Entrepreneurial Activity	0.82	0.65	1.08	0.72	-0.26	5.11	<.0001	0.37
Financial Awareness	2.61	0.65	2.95	0.67	-0.34	7.04	<.0001	0.51
Career Values: Socially Oriented	3.88	0.87	3.97	0.82	-0.09	1.42	0.155	0.1
Hopeful Future: Quality of Life	4.19	0.55	4.34	0.54	-0.15	3.86	<.0001	0.28
Personal Values Scale	4.12	0.67	4.35	0.54	-0.23	5.26	<.0001	0.39

Red values indicate statistical significance at the $p < .05$ level

Cohen's d measure of effect size, +.10 is a small difference, +.30 medium, +.50 highly significant

- Engineering students were less likely to be Starters than were business students
- Both majors had a low level of interest in Socially Oriented career outcomes

Results

RQ 2 How do Starters differ from Joiners?



- Consistent with the framework: Starters had higher scores in New Seeking, Self-Efficacy, and Iconoclastic
- Entrepreneurial Intent, Novel Goals, Innovation Orientation, Alternative Problem Solving, Mover & Shaker, Self Efficacy, Gender (Male), and Major (Business) predict Starters and Joiners career outcomes

Results

RQ 3 How do Socially-Oriented differ from Market-Oriented?



- Socially-oriented students had higher scores in Societally Proactive and Personal Morals
- Market-oriented students had higher score in Financial Security
- Assertiveness, Quality of life, Socially Oriented, Personal Values, Fair and Honest, Financial Security, and Gender (Female) predict Socially-Oriented and Market-Oriented outcomes

Summary and Implications

- SCCT is a useful framework for career choice analysis
- SJ and MS models largely align with theoretical models
- Over a third of engineering students wanted to be starters; however, engineering students were less likely to be starters than were business students
- Both majors had a low level of interest (only 9-13% of participants) in Socially Oriented careers

Summary and Implications

- Starters: new seeking, iconoclastic, and higher domain self-efficacy
- Socially-oriented: socially altruistic and personal morals
- **Educational implications**

Engineering programs and educators, and Career Development Centers should take the responsibility to help students better understand themselves, to attain greater self-awareness about what motivates them in career choice.

Acknowledgments

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Q & A

Entrepreneurial Intent (.89) asks students how important certain career goals are to them.

- 1) Start my own business.
- 2) Develop my own business.
- 3) Start a new organization.
- 4) Change the way a business or organization runs.

Novel Goals (.78) represents goals that others have not considered to address.

- 1) I like to pursue projects that others have not thought about pursuing.
- 2) I am interested in projects that involve new ideas.
- 3) I take on ventures that address unmet needs.

Career Values-Entrepreneurship (.72) refers to a career that involves autonomy and challenging projects.

- 1) A career where you make decisions.
- 2) A career where most problems are quite difficult and challenging.
- 3) A career that is interesting to do.
- 4) A career where you can see the payoff of what you create.
- 5) A career where you can have the chance to be creative.
- 6) A career that leaves you mostly free of supervision by others.

Innovation Orientation (.84) asks students to rate the extent to which students partake in a list of behaviors.

- 1) Search out new technologies, processes, techniques, and/or product ideas.
- 2) Generate creative ideas.
- 3) Promote and champion ideas to others.
- 4) Investigate and secure funds needed to implement new ideas.
- 5) Develop adequate plans and schedules for the implementation of new ideas.
- 6) Are innovative.

Optimization-Self-Starter (.80) describes the ability to self-motivate goal optimization and innovative goal optimization.

- 1) I am the one who gets the ball rolling.
- 2) I am a self-starter.
- 3) I take initiative when something needs to get done.

Alternative Problem Solving (.91) describes the ability to adapt to failure and reach a goal with alternative methods.

- 1) When one approach fails, I try different ways to reach my goals.
- 2) After a failure, I come up with alternative strategies to accomplish my goals.
- 3) After I make a mistake, I learn from it and implement new strategies.
- 4) When one plan fails, I consider what went wrong and how else I can reach my goal.
- 5) When one strategy doesn't work, I try a new approach.
- 6) I overcome obstacles by creating new solutions.

Entrepreneurial Activities (.73) asks students response to 7 entrepreneurial activity items.

- 1) Organized people around a cause.
- 2) Devised ways to make money.
- 3) Designed a new product or service.
- 4) Developed a business plan.
- 5) Started a business.
- 6) Bought or sold a company.

Sense of Self-Mover & Shaker (.76) describes relevant characteristics of participants' sense of who they are as a person.

- 1) Willing to stand up for what I believe is right.
- 2) Involved in solving community problems.
- 3) Creative or imaginative.
- 4) Politically involved.
- 5) Compassionate, concerned about all kinds of people.
- 6) Unconventional, nonconformist.
- 7) Concerned about justice and human rights.

Self Efficacy-Optimism (.88) measures students' belief that future outcomes can be influenced in a positive way.

- 1) For each problem I will find a solution.
- 2) In difficult situations I will find a way.
- 3) No task is too difficult for me.
- 4) I master difficult problems.
- 5) There is no task that is too demanding for me.
- 6) I always find a solution to a problem.

Questioning Authority (.62)

- 1) When I think a rule is pointless I will find a way around it.
- 2) People in positions of authority are not always right.
- 3) I am willing to question people in authority.

Assertive (.81) measures the assertiveness of the participants.

- 1) When I talk with others, I give my real opinions and thoughts.
- 2) I say what I think.
- 3) When I have an opinion, I usually say it.

Hopeful Future-Quality of Life (.81) describes expectations of situations that participants will experience in life.

- 1) Have a job you like doing.
- 2) Be healthy.
- 3) Have a happy family life.
- 4) Have friends you can count on.
- 5) Be respected in the community.
- 6) Be involved in helping other people.

Career Values-Socially Oriented (.70) refers to a career that involves contributing to others.

- 1) A career that gives you an opportunity to be directly helpful to others.
- 2) A career that is worthwhile to society.

Personal Values (.82) assesses the importance a participant places on personal values.

- 1) Doing what I believe is right, even if my friends make fun of me.
- 2) Standing up for what I believe, even when it's unpopular to do.
- 3) Telling the truth, even when it's not easy.
- 4) Accepting responsibility for my actions when I make a mistake or get into trouble.
- 5) Doing my best, even when I have a job I don't like.

Sense of Self-Fair and Honest (.73) describes relevant characteristics of participants' sense of who they are as a person

- 1) Fair, unbiased.
- 2) Honest or truthful.
- 3) Responsible, someone others can depend on.
- 4) Reliable, consistent.

Future Oriented (.86) describes the degree to which students think specific about their future.

- 1) Plan things out one step at a time.
- 2) Think about all of the possible good and bad things that can happen before making a decision.
- 3) Think about the consequences before doing something.
- 4) Make lists of things to do.
- 5) Make plans before making decisions.
- 6) See in advance how one thing can lead to another.
- 7) Think a lot about how my decisions will affect others.
- 8) Think things work out better if they are planned out in advance.
- 9) Take big projects and break them down into small steps before starting to work on them.
- 10) Think it's better to run through all the possible outcomes of a decision in my mind before deciding what to do.

Hopeful Future-Financial Security (.80) describes expectations of situations that participants will experience in life related to financial security.

- 1) Be able to buy the things you need.
- 2) Be able to do the things you want.
- 3) Have a job that pays well.
- 4) Be able to live wherever you want.
- 5) Be safe.