Comparison for reference group in life satisfaction:
Who will choose "Classmates" "Relatives" and "Family of children's classmates" as their reference group?[1]

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Abstract:

This paper is a study of reference groups by using data from Preference Parameters Study of Osaka University's 21st Century COE Program. As shown in the results, the frequencies of reference groups are distinct over Japan, USA and China. It is confirmed that Japanese and American women hold different preference against men, when they compare their life satisfaction with. This paper is trying to observe what kind of people will choose a specific reference group by conducting multinomial logit regression.

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Keywords: Reference groups

[1] This research uses micro data from the Preference Parameters Study of Osaka University's 21st Century COE Program 'Behavioral Macrodynamics Based on Surveys and Experiments' and its Global COE project 'Human Behavior and Socioeconomic Dynamics'. I acknowledge the program/project's contributors: Yoshiro Tsutsui, Fumio Ohtake, and Shinsuke Ikeda.

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1. Introduction

40 years ago, Easterlin posted an interesting statement by using American Institute of Public Opinion (AIPO) survey, showing that income and happiness is incoherent. The Easterlin paradox was disputed.

Eduardo (2009) argued the reference group does affect person's happiness significantly. He compared the peoples' income with those who possess a same characteristic, such as in the same age group, same political views etc. He also debates that educational attainment doesn't affect people's life satisfaction. Limited to the survey data, in his paper, other reference groups affect on life satisfaction like classmates, friends, family of your children's classmates can't be observed.

One explanation for the paradox is relative income hypothesis, which claims that people care about the reference income. However, how people choose their reference group is still shrouded in mystery.

Clark and Claudia (2010) estimated the preference of reference group by using European Social Survey data. They find that 36.3% people choose "Work colleagues" rather than "Family members" (5.8%), "Friends" (14.9%), "Others" (7.2%) and "Don't compare"(35.9%) when they compare their income with others. They operate Multinomial logit regression to detect the tendency for the preference of reference group by estimating the coefficient of gender, age, education, occupation and etc.

2. Data and Methodology

2.1 Data

This paper mainly examines how one's reference group is determined by using the data set from Osaka University Global COE program. Due to the questionnaires are distinct over the years across the countries, the assumption that people's preference for reference group doesn't change much during the years allowed the flexibility to choose discrete years data for the research own purpose across these three countries.

For the reason that educational attainment is unavailable in some years, questionnaire 2011 was selected for Japan and USA, 2012 for China. There are 466 observations with no education background in 2012 China survey, but this information was captured in 2010 survey. Thus the variable of the highest level of education was merged by these two datasets for China. (Note: Education information is from survey 2010, when sample_type_china equals 1)

2.2 Methodology

The Global COE program contains "15.a In Q.15, with whom did you compare your standard of living?" in the survey. All 13 choices are shown in Table1.

Table 1 Frequency of reference groups (USA, Japan and China)

Country	USA 2011			Japan 2011			China Urban 2012		
M/F/T	Male Perc.	Female Perc.	Total Perc.	Male Perc.	Female Perc.	Total Perc.	Male Perc.	Female Perc.	Total Perc.
Neighbor	34.91	34.57	34.73	37.99	36.91	37.41	36.81	42.32	39.57
Classmates[3]	**5.60**	**3.90**	**4.67**	**12.17**	**9.62**	**10.81**	**12.61**	**12.61**	**12.61**
Relatives	**10.88**	**14.49**	**12.86**	**3.78**	**7.47**	**5.75**	**15.80**	**14.35**	**15.07**
FCC[4]	2.23	2.97	2.63	3.16	**12.84**	8.33	1.59	1.16	1.38
SCAG[5]	5.69	5.52	5.60	7.82	3.07	5.28	9.86	8.26	9.06
SCSJ[6]	**3.91**	**3.98**	**3.95**	**9.09**	**9.16**	**9.13**	**4.93**	**5.94**	**5.43**
ACAG[7]	1.05	0.45	0.72	1.98	0.34	1.11	3.62	2.03	2.83
ACSJ[8]	0.46	0.60	0.53	2.90	0.46	1.60	3.33	2.32	2.83
Avg. nation[9]	**18.30**	**14.34**	**16.13**	**16.03**	**11.96**	**13.86**	**6.81**	**4.78**	**5.80**
Avg. world	2.00	1.43	1.69	0.26	0.11	0.18	0.00	0.29	0.14
Friend	**9.42**	**11.64**	**10.64**	**3.21**	**6.09**	**4.75**	**4.64**	**5.80**	**5.22**
Others	1.46	1.43	1.44	0.57	0.46	0.51	0.00	0.00	0.00
I don't know	4.10	4.69	4.42	1.05	1.49	1.29	0.00	0.14	0.07
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Obs.	2,197	2,664	4,861	2,277	2,609	4,886	690	690	1,380

USA	Pearson chi2(12) =	49.2210	Pr = 0.000
Japan	Pearson chi2(12) =	339.3165	Pr = 0.000
China Urban	Pearson chi2(11) =	15.9183	Pr = 0.144

[3] Your own classmates when you were in school
[4] Families of your children's classmates
[5] Worker in your company who is in your age group, has similar academic background, or who started working in the same year
[6] Worker in your company who is assigned to a similar job as yours, regardless of their age, academic background, year in which he or she joined the company
[7] Worker in another company in the same industry who belongs to the same age group, has similar academic background, or who started working in the same year
[8] Worker in another company in the same industry who is assigned to a similar job as yours, regardless of his or her age, academic background, and year in which he or she joined a company
[9] Average person in USA / Japan / China

Clark and Claudia (2010) assume that "if reference groups are to an extent endogenous, they will likely depend on the respondent's age, marital status, labor market status, and so on."[10]

The multinomial logit model was used to output the result. This research will examine the effect of subject's background information (such as educational attainment, occupational information, and the ideas on what determines / should determine people's incomes and standards of living in their nations) on their decision of a specific reference group.

3. Result

As showed in the table 1, distinction of preference for the reference group between male and female is statistically insignificant in China urban area (p=0.144), but significant at 1% level in America and Japan. Table 1 also provides the distribution of the reference group and the difference of the preference over 3 countries. "Your own classmates when you were in school" was cited much more frequently in Japan and China than USA. It seems that Japanese men are not interested in comparing with their relatives, while American and Chinese are. Japanese women are most likely to choose FCC (Families of your children's classmates) than any other people.

Due to the observations are so limited from China, convergence is not achieved by the multinomial logit regression. In appendix A, we show 8 speculations for the result of classmate, relatives and FCC for USA and Japan.[11] The information of the Americans' place of residence is not available in the survey, the speculation for cities is only provided for Japan.

As shown in the appendix, educated people are more likely to choose "classmates" but less "relatives" than "other" in USA. Full-time workers show the same tendency as educational attainment does. For Japanese, people in sales and service occupation compare less to their classmates. And those who are doing overtime work with no pay are less tended to choose "classmates" as their reference group. Though dummy variables for contract and part-time workers do not significantly explain why people choose FCC in multinomial logit regression, they show the tendency of the possibility of FCC to be chosen.

To predict the possibility after the multinomial model, marginal effects were conducted for FCC. As showed in the Table 2 that a one unit changes in the part-time dummy variable increases the probability of FCC by 0.069. And it is significant at 1% level. Being from full-time dummy variable, decreases the probability of FCC by 0.014.

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[10] Clark and Claudia (2010)

[11] "Others" was taken as base outcome. Other 9 outputs were omitted in this paper.

Table 2 Marginal effects: Change in probability of choosing FCC as reference group

	dy/dx	Std. Err.	P>z
female11	0.0421574	0.0121704	0.001
age11	0.0457994	0.0062713	0
age*age/100	-0.0547565	0.0070639	0
Employment Status (omitted : Other)			
Full-time	-0.0136484	0.0177532	0.442
Part-time	0.0694638	0.023499	0.003
Student part-time	0.0738641	0.036148	0.041
Temporary work	0.0058185	0.0385369	0.88
Contract worker	0.0073882	0.0247455	0.765

Appendix A

USA: mlogit reg. of reference group - Your own classmates

	(1) Coef.	(2) Coef.	(4) Coef.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Coef.
female11	-0.153	-0.0838	0.0197	-0.0462	-0.104	0.487	-0.277
age11	-0.310***	-0.314***	-0.301***	-0.392***	-0.239***	-0.485***	-0.273***
age*age/100	0.240***	0.263***	0.218***	0.335***	0.169***	0.398***	0.207***
edu11	0.158**						
Employment Status (omitted : Other)							
Full-time		1.315*					
Part-time		1.351*					
Student part-time		17.89					
Temporary work		16.24					
Contract worker		1.911					
City (omitted : Hokkaido)							
Tohoku							
Kanto							
KATE							
Hokuriku							
Tokai							
Kinki							
Chugoku							
Shikoku							
Kyusyu							
Type of Employment (omitted : Government employee)							
Employee of private company		0.305					
Manager of private company		-0.0814					
Self-employed		1.113					
Family employee		16.15					
Employed year 11			-0.0357				
Occupation (omitted: Office and administrative support)							
Sales and related occupations				0.658			
Managerial occupations				-0.0461			
Specialist/Technical Experts				0.215			
Service occupations				-0.416			
Industrial occupations				0.17			
Farming, fishing, and forestry				15.85			
Housewives / Househusbands				-1.287			
Student				0.255			
Retired				0.226			
Unemployed				16.65			
Other				-1.203			
Working hours and payment							
Working hours per week11					-0.0102		
Paid OT 11					0.0365		
Unpaid OT 11					0.0194		
Determination of people's incomes and standards of living							
Effort						-0.0249	
Luck						0.13	
Talent or abilities						0.202	
Personal connection						0.232	
Family environment						-0.00639	
Education						0.191	
Family of origin						0.0746	
Effort should						-0.0279	
Luck should						-0.212	
Talent or abilities should						-0.159	
Personal connection should						0.0295	
Family environment should						-0.0317	
Education should						-0.470**	
Family of origin should						-0.137	
_cons	9.042***	8.212***	9.707***	11.62***	8.108***	14.58***	9.592***
N	4794	2948	2944	2873	3762	2467	3447
pseudo R^2	0.036	0.037	0.031	0.025	0.051	0.032	0.054

Japan: mlogit reg. of reference group - Your own classmates

	(1) Coef.	(2) Coef.	(3) Coef.	(4) Coef.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Coef.
female11	-0.0434	-0.13	-0.0893	0.173	0.0948	-0.159	0.0324	-0.0169
age11	-0.105	-0.157	-0.11	-0.202	-0.198	-0.00943	-0.108	-0.096
age*age/100	0.0725	0.11	0.0762	0.191	0.171	-0.0311	0.0844	0.0636
edu11	0.0733							
Employment Status (omitted : Other)								
Full-time		-0.581						
Part-time		0.0917						
Student part-time		-2.137*						
Temporary work		-1.77						
Contract worker		14.24						
City (omitted : Hokkaido)								
Tohoku			-0.493					
Kanto			0.464					
KATE			15.13					
Hokuriku			0.532					
Tokai			15.23					
Kinki			0.452					
Chugoku			0.281					
Shikoku			-0.62					
Kyusyu			0.532					
Type of Employment (omitted : Government employee)								
Employee of private company				0.473				
Manager of private company				0.0848				
Self-employed				0.714				
Family employee				-0.971				
Employed year 11					0.146			
Occupation (omitted: Office and administrative support)								
Sales and related occupations						-0.74		
Managerial occupations						-2.233*		
Specialist/Technical Experts						-0.268		
Service occupations						-2.067*		
Industrial occupations						-1.308		
Farming, fishing, and forestry						14.64		
Housewives / Househusbands						-0.254		
Student						-2.071		
Retired						-0.687		
Unemployed						-1.968		
Other						-2.393*		
Working hours and payment								
Working hours per week11							0.0144	
Paid OT 11							0.528	
Unpaid OT 11							-0.0643**	
Determination of people's incomes and standards of living								
Effort								-0.259
Luck								0.0208
Talent or abilities								-0.0587
Personal connection								-0.06
Family environment								0.386
Education								0.327
Family of origin								-0.237
Effort should								-0.238
Luck should								0.390*
Talent or abilities should								0.0837
Personal connection should								-0.444**
Family environment should								0.0713
Education should								-0.221
Family of origin should								-0.205
_cons	5.902**	8.537**	6.009**	7.896*	7.928**	5.712*	5.507	7.765***
N	4828	3147	4886	3059	3180	4462	3050	4885
pseudo R^2	0.082	0.082	0.088	0.083	0.071	0.102	0.075	0.091

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix A (continue)

	USA: mlogit reg. of reference group - Relatives						
	(1) Coef.	(2) Coef.	(4) Coef.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Coef.
female11	0.386	0.294	0.358	0.292	0.485	0.661*	0.171
age11	-0.130**	-0.157*	-0.156**	-0.265***	-0.0786	-0.279**	-0.102*
age*age/100	0.109**	0.150*	0.125*	0.254**	0.0567	0.231*	0.0861
edu11	-0.128*						
Employment Status (omitted : Other)							
Full-time		-0.0785					
Part-time		0.298					
Student part-time		16.06					
Temporary work		15.04					
Contract worker		-0.405					
City (omitted : Hokkaido)							
Tohoku							
Kanto							
KATE							
Hokuriku							
Tokai							
Kinki							
Chugoku							
Shikoku							
Kyusyu							
Type of Employment (omitted : Government employee)							
Employee of private company			0.175				
Manager or private company			-0.683				
Self-employed			0.873				
Family employee			15.78				
Employed year 11				0.066			
Occupation (omitted: Office and administrative support)							
Sales and related occupations					0.0215		
Managerial occupations					-0.691		
Specialist/Technical Experts					-0.669		
Service occupations					-0.482		
Industrial occupations					0.249		
Farming, fishing, and forestry					17.4		
Housewives / Husbandsands					-0.462		
Student					-1.423		
Retired					-0.0693		
Unemployed					16.87		
Other					-0.838		
Working hours and payment							
Working hours per week11						-0.0125	
Paid OT 11						0.0484	
Unpaid OT 11						0.0164	
Determination of people's incomes and standards of living							
Effort							-0.115
Luck							0.124
Talent or abilities							0.0648
Personal connection							0.241
Family environment							0.107
Education							0.159
Family of origin							-0.153
Effort should							0.249
Luck should							-0.152
Talent or abilities should							0.00209
Personal connection should							0.00733
Family environment should							-0.125
Education should							-0.263
Family of origin should							-0.168
_cons	6.143***	5.757***	6.307***	8.246***	4.615***	10.08***	5.532***
N	4794	2948	2944	2873	3762	2467	3447
pseudo R^2	0.036	0.037	0.031	0.025	0.051	0.032	0.054

	Japan: mlogit reg. of reference group - Relatives							
	(1) Coef.	(2) Coef.	(3) Coef.	(4) Coef.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Coef.
female11	0.923**	0.739	0.918**	0.847	0.884	0.659	0.736	0.981**
age11	0.063	-0.021	0.0542	-0.0898	-0.0672	0.161	0.061	0.0694
age*age/100	-0.04	0.0424	-0.0288	0.14	0.104	-0.144	-0.0285	-0.0426
edu11	-0.0291							
Employment Status (omitted : Other)								
Full-time		0.0652						
Part-time		0.654						
Student part-time		-1.133						
Temporary work		-2.386						
Contract worker		14.31						
City (omitted : Hokkaido)								
Tohoku			0.0708					
Kanto			0.919					
KATE			16.02					
Hokuriku			0.877					
Tokai			15.67					
Kinki			1.195					
Chugoku			0.845					
Shikoku			0.764					
Kyusyu			1.197					
Type of Employment (omitted : Government employee)								
Employee of private company				0.463				
Manager or private company				-0.272				
Self-employed				0.517				
Family employee				-0.985				
Employed year 11					0.133			
Occupation (omitted: Office and administrative support)								
Sales and related occupations						-0.735		
Managerial occupations						-2.408**		
Specialist/Technical Experts						0.0147		
Service occupations						-1.582		
Industrial occupations						-1.023		
Farming, fishing, and forestry						15.22		
Housewives / Husbandsands						0.425		
Student						-2.208		
Retired						-0.421		
Unemployed						-1.568		
Other						-2.436*		
Working hours and payment								
Working hours per week11							0.0204	
Paid OT 11							0.494	
Unpaid OT 11							-0.108***	
Determination of people's incomes and standards of living								
Effort								-0.223
Luck								0.094
Talent or abilities								-0.0289
Personal connection								-0.172
Family environment								0.243
Education								0.349
Family of origin								-0.178
Effort should								0.0741
Luck should								0.283
Talent or abilities should								0.037
Personal connection should								-0.414*
Family environment should								0.27
Education should								-0.306
Family of origin should								-0.112
_cons	-0.16	1.969	-1.148	2.67	2.176	-1.116	-1.057	0.288
N	4828	3147	4886	3059	3180	4462	3050	4885
pseudo R^2	0.082	0.082	0.088	0.083	0.071	0.102	0.075	0.091

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix A (continue)

	USA: mlogit reg. of reference group - FCC						
	(1)	(2)	(4)	(5)	(6)	(7)	(8)
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
female11	0.448	0.0537	0.16	0.291	0.299	0.703	0.314
age11	-0.022	0.103	-0.0479	-0.0774	-0.00564	-0.019	0.0577
age*age/100	-0.0162	-0.15	0.00145	0.0341	-0.0382	-0.079	-0.106
edu11	0.0792						
Employment Status (omitted : Other)							
Full-time		-0.499					
Part-time		0.397					
Student part-time		15.87					
Temporary work		15.67					
Contract worker		0.365					
City (omitted : Hokkaido)							
Tohoku							
Kanto							
KATE							
Hokuriku							
Tokai							
Kinki							
Chugoku							
Shikoku							
Kyusyu							
Type of Employment (omitted : Government employee)							
Employee of private company			0.176				
Manager of private company			-0.523				
Self-employed			0.585				
Family employee			15.51				
Employed year 11				0.121			
Occupation (omitted: Office and administrative support)							
Sales and related occupations					0.0408		
Managerial occupations					-0.661		
Specialist/Technical Experts					0.0274		
Service occupations					-0.371		
Industrial occupations					0.527		
Farming, fishing, and forestry					16.73		
Housewives / Househusbands					0.668		
Student					-1.217		
Retired					-0.389		
Unemployed					17.24		
Other					0.143		
Working hours and payment							
Working hours per week11						-0.0275*	
Paid OT 11						0.0402	
Unpaid OT 11						0.017	
Determination of people's incomes and standards of living							
Effort							-0.623**
Luck							0.0274
Talent or abilities							0.116
Personal connection							0.302
Family environment							-0.145
Education							0.211
Family of origin							0.0535
Effort should							0.463
Luck should							-0.0447
Talent or abilities should							-0.192
Personal connection should							0.0295
Family environment should							-0.0704
Education should							-0.454*
Family of origin should							-0.0827
_cons	1.552	-0.501	2.855	3.027	1.749	4.295	1.373
N	4794	2948	2944	2873	3762	2467	3447
pseudo R^2	0.036	0.037	0.031	0.025	0.051	0.032	0.054

	Japan: mlogit reg. of reference group - FCC							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
female11	1.644***	0.808	1.612***	1.571**	1.461**	1.221**	0.744	1.626***
age11	0.718***	0.761***	0.703***	0.689***	0.735***	0.851***	0.947***	0.714***
age*age/100	-0.837***	-0.887***	-0.820***	-0.777***	-0.835***	-0.979***	-1.083***	-0.832***
edu11	0.0433							
Employment Status (omitted : Other)								
Full-time		-0.52						
Part-time		1.368						
Student part-time		-0.753						
Temporary work		-1.661						
Contract worker		14.42						
City (omitted : Hokkaido)								
Tohoku			-0.767					
Kanto			0.69					
KATE			14.74					
Hokuriku			-0.368					
Tokai			15.09					
Kinki			0.484					
Chugoku			-0.32					
Shikoku			-0.713					
Kyusyu			0.206					
Type of Employment (omitted : Government employee)								
Employee of private company				0.321				
Manager of private company				-0.183				
Self-employed				0.603				
Family employee				-0.7				
Employed year 11					-0.00981			
Occupation (omitted: Office and administrative support)								
Sales and related occupations						-0.571		
Managerial occupations						-2.647**		
Specialist/Technical Experts						-0.443		
Service occupations						-1.676		
Industrial occupations						-1.387		
Farming, fishing, and forestry						14.11		
Housewives / Househusbands						0.521		
Student						-25.58		
Retired						-13.41		
Unemployed						-2.04		
Other						-2.311*		
Working hours and payment								
Working hours per week11							-0.0147	
Paid OT 11							0.458	
Unpaid OT 11							-0.100***	
Determination of people's incomes and standards of living								
Effort								-0.0873
Luck								0.0678
Talent or abilities								-0.145
Personal connection								0.116
Family environment								0.317
Education								0.256
Family of origin								-0.0922
Effort should								-0.247
Luck should								0.329
Talent or abilities should								-0.00423
Personal connection should								-0.393*
Family environment should								0.118
Education should								-0.299
Family of origin should								-0.181
_cons	-12.94***	-12.99***	-12.78***	-12.73***	-13.35***	-14.08***	-16.83***	-11.38***
N	4828	3147	4886	3059	3180	4462	3050	4885
pseudo R^2	0.082	0.082	0.088	0.083	0.071	0.102	0.075	0.091

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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