Exploring University Students' Activities and Travels based on Travel Diary Report

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Introduction

- ► Transportation policy now tends to be more sustainable in exploiting resources.
  - ► A need for more comprehensive approaches in exploring the behavior of travelers
    - ► Lack in developing countries
- ► As a fact, most studies about travel and its related activities are conducted using data from developed countries.
- ► Then, it needs a first attempt in studying travel diary,
  - ► this study provides basic knowledge to build the body of knowledge regarding activity based study using travel diary.

Objective

- to explore the activities and its related travels conducted by university students
  - based on two days travel diary, one working day and a weekend.
  - collected from students of five public and five private universities in the city of Bandung, Indonesia.

Data Collection (1)

design of the travel diary questionnaire

Data Collection (2)

- There are hundreds of colleges and universities in the City of Bandung, Indonesia,
  - total number of university students in Bandung of 130.744 students
- sample was collected from ten universities,
  - five public universities and five private universities
  - sample size was 400 respondents

Public University			Private University		
University	Student Body*	Sample Size	University	Student Body*	Sample Size
UPI	39.231	120	UNPAS	12.758	39
UNPAD	19.254	59	Maranatha	10.494	32
ITB	16.674	51	UNIKOM	10.172	31
POLBAN	4.163	13	UNPAR	9.839	30
POLMAN	795	2	LP3I	7.364	23
*Source: Directorate General of Higher Education , 2012					

Data Collection (3)

- trip diary was assisted by 21 questionnaire administrators
  - questionnaire administrator met the respondents three times,
    - explaining and requesting
    - reminding
    - collecting filled questionnaire.
- each respondent was asked to report their travels and activities for 24 hours
  - in one workday as well as one weekend or holiday
- After reviewing the completeness,
  - only 784 sets, which come from 392 respondents

Characteristics of Respondents (1)

- 51% of them are male.
- 98% are between 17 and 29 years old.
- dominated by student in bachelor degree (85.6%) and diploma (12.1%).
- driving license ownership
  - not owned driving license (41.3%)
  - one driving license,
    - for motorcycle (Type C) as much as 33.3%
    - for passenger car (Type A) as much as 5.6%.
  - two driving license, Type A and C, (18.4%)
  - difference distribution of driving license's ownership
    - between male and female (χ^2 =182.995; df = 4, p-value = 0.000),
    - between public and private university (χ^2 =34.841; df = 5, p-value = 0.000).

Characteristics of Respondents (2)

- Car ownership
  - do not have any car (63.1%),
  - one unit (23.1%)
  - significant difference between public and private university (χ^2 =35.303; df = 4, p-value = 0.000).
- Motorcycle ownership
  - 28.8% of students do not have any
  - 45.4% of students own one unit
  - 16.8% own two units
  - no significant differences between private and private universities χ^2 =8.777; df = 4, p-value = 0.067)
- Access to public transport,
  - 17% of them have an access to one type of public transport
  - 39% have two and 27.4% have access to three types of public transport.
  - no significant different in number of access to public transport between students from public and private university (χ^2 =14.725; df = 5, p-value = 0.012).

Comparing Travel Characteristics (1)

Distribution of Number of Trips to Campus per Week

Number of trips to campus per week	Gender		Type of University	
	Male	Female	Public	Private
1	4	2	2	4
2	14	8	14	8
3	32	24	40	16
4	63	83	105	41
5	137	155	187	105
6	144	110	126	128
χ^2; df.; p-value	11.664; 5; 0.040		26.884; 5; 0.000	

Distribution of Number of Alternative Routes to Reach University

Number of alternative routes	Gender		Type of University	
	Male	Female	Public	Private
1	84	74	84	74
2	175	189	231	133
3	89	67	99	57
4	16	22	26	12
5	4	6	4	6
6	24	22	28	18
χ^2; df.; p-value	5.523; 5; 0.355		8.140; 5; 0.149	

Comparing Travel Characteristics (2)

Comparisons of Modes' Usage Frequency and Duration between Type of University

Frequency of Usage	t-stat (p-value)	Duration of Usage	t-stat (p-value)
Car	0.440 (0.660)	Car	0.393 (0.694)
Motorcycle	-0.696 (0.486)	Motorcycle	-0.134 (0.894)
Paratransit	0.660 (0.509)	Paratransit	0.335 (0.738)
Rickshaw	1.416 (0.158)	Rickshaw	1.349 (0.178)
Bus	2.230 (0.026)*	Bus	1.605(0.109)
Walking	4.328(0.000)*	Walking	0.429 (0.668)
Bicycle	-0.999(0.318)	Bicycle	-0.712 (0.477)

Comparisons of Modes' Usage Frequency and Duration between Gender

Frequency of Usage	t-stat (p-value)	Duration of Usage	t-stat (p-value)
Car	1.023 (0.307)	Car	0.827 (0.408)
Motorcycle	6.842 (0.000)*	Motorcycle	3.651 (0.000)*
Paratransit	-7.174 (0.000)*	Paratransit	-6.928 (0.000)*
Rickshaw	-0.022 (0.983)	Rickshaw	-0.450 (0.653)
Bus	-1.448 (0.147)	Bus	-0.457 (0.148)
Walking	-5.460 (0.000)*	Walking	1.011 (0.313)
Bicycle	1.843 (0.066)	Bicycle	1.166 (0.244)

*significant at 5%

Comparing Travel Characteristics (3)

Comparisons of Modes' Usage Frequency ad Duration between Type of Day

Frequency of Usage	t-stat (p-value)	Duration of Usage	t-stat (p-value)
Car	-3.232 (0.001)*	Car	-3.580 (0.000)*
Motorcycle	1.455 (0.146)	Motorcycle	-0.496 (0.620)
Paratransit	1.742 (0.082)	Paratransit	0.664 (0.507)
Rickshaw	0.000 (1.000)	Rickshaw	0.429 (0.668)
Bus	0.373 (0.709)	Bus	-0.366 (0.714)
Walking	2.073 (0.038)*	Walking	0.381 (0.704)
Bicycle	-0.807 (0.420)	Bicycle	-1.759 (0.079)

Comparisons of Travel Characteristics

Trip Characteristics	t-stat (p-value)		
	Between Type of University	Between Gender	Between Type of Day
Number of trips per day	4.444 (0.000)*	-4.329 (0.000)*	2.079 (0.038)*
Length of trip duration per day	0.795 (0.427)	1.089 (0.276)	-1.698 (0.090)
Cost of travel per day	2.031 (0.043)*	-0.208 (0.835)	-1.272 (0.204)
Cost of parking per day	-1.395 (0.164)	2.314 (0.021)*	-3.081 (0.002)*

*significant at 5%

Comparing Activity Characteristics (1)

Comparisons of Activity Frequency

Frequency of Activity	t-stat (p-value)		
	Between Type of University	Between Gender	Between Type of Day
Eating	2.440 (0.015)*	-0.254 (0.800)	3.231 (0.001)*
Sleeping	0.017 (0.986)	0.410 (0.682)	-2.375 (0.018)*
Resting	-0.188 (0.851)	-0.570 (0.569)	-0.472 (0.637)
Studying	1.422 (0.156)	-1.778 (0.076)	13.382 (0.000)*
Working	1.444 (0.149)	0.106 (0.915)	0.537 (0.591)
Dropping by	-0.206 (0.837)	4.120 (0.000)*	-0.954 (0.341)
Domestic matter	-0.476 (0.634)	-5.951 (0.000)*	-1.191 (0.234)
Personal matter	1.934 (0.053)*	-3.331 (0.001)*	0.467 (0.641)
Health	-1.725 (0.085)	2.101 (0.036)*	-2.422 (0.016)*
Socializing	2.087 (0.037)*	1.612 (0.107)	3.691 (0.000)*
Recreation	-2.508 (0.012)*	1.713 (0.087)	-6.547 (0.000)*
Praying	2.077 (0.038)*	-4.190 (0.000)*	0.294 (0.769)
Browsing internet	3.808 (0.000)*	1.896 (0.058)	-0.653 (0.514)
Parking	0.554 (0.580)	3.658 (0.000)*	1.791 (0.074)
Waiting	0.988 (0.324)	-5.418 (0.000)*	3.710 (0.000)*
Waking up activities	-4.061 (0.000)*	-0.891 (0.373)	-0.325 (0.745)
Others	7.431 (0.000)*	-5.951 (0.000)*	-0.323 (0.747)

*significant at 5%

Comparing Activity Characteristics (2)

Comparisons of Activity Duration

Duration of Activity	t-stat (p-value)		
	Between Typeof University	Between Gender	Between Typeof Day
Eating	0.147 (0.883)	-1.185 (0.236)	0.661 (0.509)
Sleeping	1.308 (0.191)	-0.453 (0.651)	-1.931 (0.054)
Resting	-0.605 (0.545)	0.104 (0.917)	-1.576 (0.115)
Studying	-0.701 (0.484)	-0.673 (0.501)	15.064 (0.000)
Working	0.282 (0.778)	1.904 (0.057)	-0.108 (0.914)
Dropping by	-0.282 (0.778)	2.460 (0.014)*	-1.480 (0.139)
Domestic matter	1.080 (0.281)	-4.721 (0.000)*	-3.606 (0.000)*
Personal matter	-1.469 (0.142)	-2.862 (0.004)*	-0.446 (0.655)
Health	-2.158 (0.031)*	2.286 (0.023)*	-1.982 (0.048)*
Socializing	-0.539 (0.590)	3.412 (0.001)*	1.916 (0.056)
Recreation	-2.944 (0.003)*	4.055 (0.000)*	-7.876 (0.000)*
Praying	-0.460 (0.646)	-0.060 (0.952)	-1.010 (0.313)
Browsing internet	2.219 (0.027)*	3.903 (0.000)*	-2.391 (0.017)*
Parking	0.787 (0.432)	0.170 (0.865)	-0.563 (0.574)
Waiting	-0.370 (0.711)	-2.235 (0.026)*	2.271 (0.023)*
Waking up activities	0.444 (0.657)	1.695 (0.091)	-0.974 (0.330)
Others	5.626 (0.000)*	-4.551 (0.000)*	-2.231 (0.026)*

*significant at 5%

Parameters Estimate for Travel Duration

Variables	B	Sig.
(Constant)	138.085	.000
Weekday [D]	-16.507	.071
Education is Bachelor degree [D]	-28.568	.029
Number of alternative routes are five [D]	-67.487	.104
Do not have any motorcycle [D]	-129.214	.000
Own one unit of motorcycle [D]	-109.092	.001
Own two units of motorcycle [D]	-111.632	.001
Own three units of motorcycle [D]	-125.700	.001
Own more than four units of motorcycle [D]	-132.037	.001
One mode is available [D]	131.158	.004
Two modes are available [D]	131.517	.003
Three modes are available [D]	154.946	.001
Four modes are available [D]	146.882	.002
Five modes are available [D]	190.935	.000
More than five modes are available [D]	224.832	.000
R-square	0.056	
F; p-value	3.260; 0.000	

Parameters Estimate for Total Number of Trips per Day

Variables	B	Sig.
(Constant)	6.144	.225
Weekday [D]	1.297	.023
Age between 17 – 29 years old [D]	5.887	.055
Age between 30 – 39 years old [D]	19.206	.003
Male [D]	1.753	.008
Position at household as children [D]	7.040	.035
Do not have any driving license [D]	1.113	.099
Education is bachelor degree [D]	-6.326	.000
Number of trip per day is one ([D]	-7.731	.019
Number of trips per day are three [D]	-2.107	.061
One alternative route is available [D]	3.616	.114
Two alternative routes are available [D]	4.690	.035
Three alternative routes are available [D]	4.171	.066
Four alternative routes are available [D]	6.481	.011
More than five alternative routes are available [D]	6.473	.009
Own one unit automobile [D]	1.275	.079
Own two units of motorcycle [D]	1.723	.032
Do not have any bicycle [D]	-3.160	.000
Two modes are available [D]	-1.425	.076
Three modes are available[D]	-1.893	.028
Four modes are available [D]	-3.149	.010
Five modes are available [D]	-4.529	.001
As a student of public university [D]	2.699	.000
R-square	0.193	
F; p-value	8.168; 0.000	

Parameters Estimate for Total Duration of Activity

Variables	B	Sig.
(Constant)	2051.394	.000
Age between 17 – 29 years old [D]	350.775	.087
Own several types of driving licenses [D]	112.449	.057
Education is diploma / vocational [D]	-168.241	.013
Number of trips per day are two [D]	-265.552	.037
Three alternative routes are available [D]	-159.145	.004
Four alternative routes are available [D]	174.344	.080
More than five alternative routes are available [D]	-159.611	.084
More than five modes are available [D]	-249.956	.072
Do not have any automobile [D]	-420.775	.088
Own one unit of automobile [D]	-506.031	.043
Own two units of automobile [D]	-466.959	.070
Own three units of automobile [D]	-403.915	.154
Own more than four units of automobile [D]	-427.111	.131
Do not have any motorcycle [D]	644.771	.024
Own one unit of motorcycle [D]	761.899	.008
Own two units of motorcycle [D]	770.340	.008
Own three units of motorcycle [D]	580.137	.047
Own more than four units of motorcycle [D]	775.055	.011
Do not have any bicycle [D]	-262.386	.026
Own one unit of bicycle [D]	-179.963	.159
As a student of public university [D]	76.625	.092
R-square	0.079	
F; p-value	3.071; 0.000	

Parameters Estimate for Number of Activity

Variables	B	Sig.
(Constant)	14.930	.000
Weekday [D]	1.530	.007
Age between 17 – 29 years old [D]	9.232	.004
Age between 30 – 39 years old [D]	27.460	.000
Male [D]	2.407	.000
Not as a main member of family (relatives) [D]	-13.039	.024
Education is bachelor degree [D]	-7.196	.000
Number of trip per day is one [D]	-6.777	.045
Number of trips per day are three [D]	-1.993	.080
Do not have any automobile [D]	6.856	.027
Own one unit of automobile [D]	6.560	.038
Own two units of automobile [D]	5.338	.098
Own three units of automobile [D]	5.223	.150
Own more than four units of automobile [D]	6.387	.075
Do not have any motorcycle [D]	2.402	.039
Own one unit of motorcycle [D]	2.250	.043
Own two units of motorcycle [D]	3.087	.012
Do not have any bicycle [D]	-10.193	.002
Own one unit of bicycle [D]	-6.924	.035
Own two units of bicycle [D]	-6.354	.066
Own three units of bicycle [D]	-10.327	.045
Five modes are available [D]	-2.787	.025
As a student of public university [D]	3.225	.000
R-square	0.207	
F; p-value	8.878; 0.000	

Conclusions

- When the travel diary between students from public and private university are compared,

- 17 types of common activities for university students were identified.
  - The frequency per day of some activities are significantly different
  - Duration per day of some activities are significantly different
    - by student of private and public university or between workday and weekend

- Students tend
  - to spend more time for activity
    - when they are younger students, having multiple type of driving licenses, or public university;
  - to travel less frequent when there is more number of available alternative routes;
  - to spend less cost for their activities on weekday than weekend;
  - to like more on findings alternative routes when they have less activities.
  - to spend less cost when have higher accessibility.

Thank you…