Data Article

Attitudinal dataset for mediating the effects of public acceptance on bus reform scheme in a developing country context

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ABSTRACT

This paper presents a comprehensive dataset of how public perceptions and its statistical implication on the behavioral adaptation toward the acceptability of bus reform scheme proposed by the government of Aceh, Indonesia. Studies indicate that public response to such a proposed policy is significantly related to the effectiveness of its implementation. Given the absence of studies from the developing countries context, a stated preference (SP) questionnaire is developed to investigate the public’s consciousness concerning bus reform acceptance. A paper-pencil based questionnaire survey performed by direct interview was conducted in late 2017 and early 2018. The questionnaires were distributed with a total of 450 questionnaires valid. The most pertinent inquiries in our questionnaires were designated to attain (i) attitudinal indicators toward the acceptance of bus reform policy, (ii) attitudinal indicators related to perceived appropriateness of the policy, (iii) perceived awareness of problem private-mode in society, (iv) private-mode dependency, (v) inhibition of freedom of movements and (vi) correct and acceptable policy. We implemented a 4-point Likert scale such as 1 to 4 (strongly disagree to strongly agreed) in order to style the questionnaire easy to answer. A valid dataset was analyzed using Confirmatory Factor Analysis (CFA) for revealing how public perception has

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The dataset presents organized dataset of attitudinal data (psychological indicators) in the context of emerging countries related to the travel behavior analysis.

- The data provide some essential measurements to offer greater insight related to public consciousness.
- The empirical examination could serve as a scale for other studies.
- Data revealed how public perceptions are statistically significant explained the perceived effectiveness of the proposed bus reform policy by the government.

### Value of the data

1. Data

The dataset presents in this paper containing the socio-demographic characteristics, travel attributes, and attitudinal indicators. The dataset obtained from the questionnaire survey using Stated Preference (SP) experiment [1–5]. Target respondents were commuters, commercial visitors, employees and students within the proposed bus reform policy so-called “Trans Koetaradja” (hereafter “TK”). The TK is a new technology and bus system with a capacity of 60 passengers equipped with an air conditioner, providing more comfort to the passengers [6–8]. TK reforms required to achieve efficiency and sufficiency of the city bus system. The TK now is under trial runs, a free of charge service is applied within running corridors. The trial run corridors of TK are within the city of Banda Aceh (see Fig. 1a) as the city heavily relies on private modes such as cars and motorcycles [9,10]. The target area of this study is corridor 1 (red), 3 (dark blue), and 4 (yellow) as shown in Fig. 1b.

The distributions of socio-demographic and travel attributes are described in Table 1 and Table 2. The attitudinal indicators which are consist of the information related to (1) attitudinal indicators toward the acceptance of bus reform policy; (ii) attitudinal indicators related to perceived appropriateness of the policy; (iii) perceived awareness of problem private-mode in society; (iv) private-mode dependency; (v) inhibition of freedom of movements, and (vi) correct and acceptable policy has illustrated in Table 3.

### 2. Experimental design and material

The data for our work is consist of socio-economic characteristics, mobility/travel attributes and attitudinal indicators related to public response to the acceptance of Bus Reform policy. As for socio-economic and travel attributes distribution can be seen in Tables 1 and 2.
Concerning with attitudinal data, the SP experimental [11] is applied to deal with attitudinal data in qualitative nature. The SP with a 4-point Likert scale is employed to wide-ranging information related to the attitudinal questions. To gain more assistance by the respondents, the questionnaire form has designed as simple as possible. The vital of our questions are attitudinal intentions toward bus reform policy by the government. In this case, we adopted preceding works done by [11–13].

Fig. 1. (a) Banda Aceh city, located in the island of Sumatera; (b) Trans Koetaradja corridors (overlay on map data © 2019 Google).
Table 1
Distribution of Socio-demographic data.

| Item                  | Category          | Number of Samples | Share (%) |
|-----------------------|-------------------|-------------------|-----------|
| Gender                | Male              | 222               | 49.3%     |
|                       | Female            | 228               | 50.7%     |
|                       | Total             | 450               | 100%      |
| Age                   | 19 years or less  | 95                | 21.1%     |
|                       | 20–29 years       | 219               | 48.7%     |
|                       | 30–39 years       | 62                | 13.8%     |
|                       | 40–49 years       | 32                | 7.1%      |
|                       | 50–59 years       | 27                | 6.0%      |
|                       | 60 years or more  | 15                | 3.3%      |
|                       | Total             | 450               | 100%      |
| Education             | Primary School    | 300               | 66.7%     |
|                       | College           | 28                | 6.2%      |
|                       | University/Bachelor | 112            | 24.9%     |
|                       | University/post graduate | 10 | 2.2% |
|                       | Total             | 450               | 100%      |
| Monthly Income        | 1.9 million IDR or less | 198 | 44.0% |
|                       | 2–3.9 million IDR | 157               | 34.9%     |
|                       | 4–5.9 million IDR | 36                | 8.0%      |
|                       | 6–7.9 million IDR | 45                | 10.0%     |
|                       | 8 million IDR or more | 14 | 3.1% |
|                       | Total             | 450               | 100%      |
| Occupation            | Working           | 122               | 27.1%     |
|                       | Student           | 178               | 39.6%     |
|                       | Housewife         | 66                | 14.7%     |
|                       | Unemployed        | 29                | 6.4%      |
|                       | Others            | 55                | 12.2%     |
|                       | Total             | 450               | 100%      |
| Driver’s license       | Has driver’s license | 321          | 71.3%     |
|                       | Has no driver’s license | 129  | 28.7% |
|                       | Total             | 450               | 100%      |

Table 2
Distribution of mobility/travel attributes.

| Item                                                                 | Category                      | Number of Samples | Share (%) |
|----------------------------------------------------------------------|-------------------------------|-------------------|-----------|
| Purpose of traveling on the day of the questionnaire survey           | Work                          | 95                | 21.1%     |
|                                                                      | Meeting and sales             | 10                | 2.2%      |
|                                                                      | Delivery                      | 4                 | 0.9%      |
|                                                                      | Trader                        | 33                | 7.3%      |
|                                                                      | Studying and lessons          | 168               | 37.3%     |
|                                                                      | Entertainment and eating      | 68                | 15.1%     |
|                                                                      | others                        | 72                | 16.0%     |
|                                                                      | Total                         | 450               | 100%      |
| Travel mode used on the day of the questionnaire survey               | Private mode                  | 387               | 86.0%     |
|                                                                      | Public Mode                   | 63                | 14.0%     |
|                                                                      | Total                         | 450               | 100%      |
| Frequency of private mode usage in daily life                        | More than 5 days a week       | 338               | 75.1%     |
|                                                                      | 3–4 days a week               | 40                | 8.9%      |
|                                                                      | 1–2 days a week               | 24                | 5.3%      |
|                                                                      | 1 days a week                 | 15                | 3.3%      |
|                                                                      | 1 day a month or less         | 33                | 7.3%      |
|                                                                      | Total                         | 450               | 100%      |
| Frequency of public mode usage in daily life                         | More than 5 days a week       | 58                | 12.9%     |
|                                                                      | 3–4 days a week               | 56                | 12.4%     |
|                                                                      | 1–2 days a week               | 36                | 8.0%      |
|                                                                      | 1 days a week                 | 48                | 10.7%     |
|                                                                      | 1 day a month or less         | 252               | 56.0%     |
|                                                                      | Total                         | 450               | 100%      |
| Latent 1: Perceived appropriateness of the policy (PAP) | Q1 (Indicator1) | The bus reform is a correct policy to deal with motorized traffic | 3.11 |
|-------------------------------------------------------|-----------------|---------------------------------------------------------------|------|
|                                                       | Q2 (Indicator2) | The bus reform is an acceptable policy                        | 3.16 |
|                                                       | Q3 (Indicator3) | The government has given an understanding of the proposed policy | 2.74 |
|                                                       | Q4 (Indicator4) | The proposed policy is an appropriate policy to reduce congestion | 3.10 |
| Latent 2: Private-mode dependency (PDC)                | Q5 (Indicator5) | A private-mode is necessary for daily activities               | 3.22 |
|                                                       | Q6 (Indicator6) | Like to drive private-mode (car or motorcycle)                | 3.00 |
|                                                       | Q7 (Indicator7) | Public transport is expensive and has a limited route          | 2.22 |
| Latent 3: Awareness of problem private-mode in society (APS) | Q8 (Indicator8) | Increasing accident rate in the city                          | 2.94 |
|                                                       | Q9 (Indicator9) | Congestion is getting worse in cities                          | 2.82 |
|                                                       | Q10 (Indicator10) | Emissions and noise are getting worse in cities                | 2.85 |
| Latent 4: Inhibition of freedom of movement/less accessibility of the bus (IMA) | Q11 (Indicator11) | The Bus could reduce freedom/maneuver in the road traffic due to the use of large road space | 2.37 |
|                                                       | Q12 (Indicator12) | The Bus only serves limited routes/access                      | 2.78 |
|                                                       | Q13 (Indicator13) | Would be decreased activities if using the Bus                 | 2.56 |
| Latent 5: Correct and acceptable policy (CAP)         | Q14 (Indicator14) | The proposed bus reform is correct and acceptable policy      | 3.10 |
|                                                       | Q15 (Indicator15) | The proposed bus reform is a suitable policy to deal with traffic and environmental problem | 3.01 |

**Fig. 2.** The distribution of the answered responses to attitudinal questions.
Table 3 shows the distribution of the answered responses to attitudinal questions using a 4-point Likert scale 1 to 4 (strongly disagree to strongly agreed) as illustrated in Fig. 2 and summarized in Table 4.

3. Statistical framework of analysis

A confirmatory factor analysis (CFA) approach is used to delve more deeply related respondent’s psychological intents. The CFA is a kind of structural equation modeling (SEM) that deals with measurement models. That is the relationships between observed measures or indicators such as attitudinal related questions as described in Table 3. Thus, the central concern of CFA is modeling factors or latent variables that are not directly measured but manifest from psychological perceptions or indicators. Therefore, in this study, CFA is applied and used to investigate the determinant factors to accept bus reform policy based on the unobserved variable (latently). Our hypothesized in this work were (1) perceived appropriateness of the policy and awareness of problem private-mode in society would have a positive effect on their intentions to support the proposed policy; (2) determinant of private-mode dependency and inhibition of freedom of movement/less accessibility of the bus would have an adverse consequence on such intentions. By implementing CFA able to delve more deeply related respondent’s behavioral intentions respect to the proposed policy. The CFA model as a part of the multiple indicators multiple causes model proposed by [14,15] systematically the CFA or known as a measurement model, given by:

\[ y_i = A \eta_i + \zeta_i \]  

(1)

Where \( y_i \) is a vector of observable attitudinal indicators, \( \eta_i \) is a vector of mediators (latent variables), \( A \) are matrices of unknown parameters to be calibrated, and the terms \( \zeta_i \) are vector of measurement
errors. More application related to the latent variable modeling within a broad of travel behavioral arena can be surveyed in the previous studies done by [1–5].

Statistically speaking, the model and its parameters must be tested using several statistical diagnose tests. We used several model fit indexes to test the goodness of fit model namely the root mean square error of approximation (RMSEA = 0.059), the Adjusted Goodness of Fit Index (AGFI = 0.915), the comparative fit index and the Tucker-Leis index (CFI = 0.939, TFI = 0.972), and χ2/degrees of freedom (χ2/df = 2.58) as described in Table 5. The result of calibrated parameters among mediators (latent 1–5) and its indicators (question Q1–Q15) using CFA can be seen in Fig. 3. Moreover, the estimated parameters among mediators’ latent variables describe in Table 6. For the readers who interested in the discussion about statistical inference from the empirical modeling using CFA are invited to read [8].

Table 6.
Table 6
Calibrated parameters of CFA: coefficients among latent variables (ellipses) and indicators (rectangular); *** path coefficient significant at a 1% error level [8].

| Mediator (Latent Variable)                                      | Question ID (Indicator ID) | Content of Attitudinal Questions                                                                 | Factor Loading/Path Coefficient |
|-----------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|
| Latent 1: Perceived appropriateness of the policy (PAP)         | Q1 (Indicator1)            | The bus reform is a correct policy to deal with motorized traffic                               | 1.000                           |
|                                                                | Q2 (Indicator2)            | The bus reform is an acceptable policy                                                          | 0.665***                        |
|                                                                | Q3 (Indicator3)            | The government has given an understanding of the proposed policy                               | 0.555***                        |
|                                                                | Q4 (Indicator4)            | The proposed policy is an appropriate policy to reduce congestion                             | 0.720***                        |
| Latent 2: Private-mode dependency (PDC)                         | Q5 (Indicator5)            | A private-mode is necessary for daily activities                                                | 1.000                           |
|                                                                | Q6 (Indicator6)            | Like to drive private-mode (car or motorcycle)                                                  | −0.790**                        |
|                                                                | Q7 (Indicator7)            | Public transport is expensive and has a limited route                                            | −0.112*                         |
| Latent 3: Awareness of problem private-mode in society (APS)   | Q8 (Indicator8)            | Increasing accident rate in the city                                                            | 1.000                           |
|                                                                | Q9 (Indicator9)            | Congestion is getting worse in cities                                                           | 1.208**                         |
|                                                                | Q10 (Indicator10)          | Emissions and noise are getting worse in cities                                                  | 1.025***                        |
| Latent 4: Inhibition of freedom of movement/less accessibility of the bus (IMA) | Q11 (Indicator11)          | The Bus could reduce freedom/maneuver in the road traffic due to the use of large road space    | 1.000                           |
|                                                                | Q12 (Indicator12)          | The Bus only serves limited routes/access                                                        | 0.269**                         |
|                                                                | Q13 (Indicator13)          | Would be decreased activities if using the Bus                                                  | 0.681***                        |
| Latent 5: A correct and acceptable policy (CAP)                | Q14 (Indicator14)          | The proposed bus reform is correct and acceptable policy                                         | 1.000                           |
|                                                                | Q15 (Indicator15)          | The proposed bus reform is suitable policy to deal with traffic and environmental problem       | 1.203***                        |

***, **, and * significant at 1%, 5%, and 10% level.

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Transparency document

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2019.104035.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104035.

Appendix. The summary of the English translation of the questionnaire

The questionnaire of attitudinal data is structured into five parts of the mediator (latent variable). The attitudinal indicators which are consist of five parts of the information related to (1) attitudinal indicators toward the acceptance of bus reform policy; (ii) attitudinal indicators related to perceived appropriateness of the policy; (iii) perceived awareness of problem private-mode in society; (iv) private-mode dependency; (v) inhibition of freedom of movements, and (vi) correct and acceptable
policy. The answered responses to attitudinal questions using a 4-point Likert scale 1 (strongly disagree), scale 2 (disagree), scale 3 (agreed), and scale 4 (strongly agree).

Part 1: Perceived appropriateness of the policy (PAP).
Q1 Do you agree that “the bus reform” is a correct policy to reduce motorized traffic?
Q2 Do you think that “the bus reform” policy can be accepted by the public?
Q3 Do you think that the government has given an understanding of the proposed policy?
Q4 Do you think that the proposed policy is an appropriate policy to reduce congestion in the city center?

Part 2: Private-mode dependency (PDC).
Q5 Do you think a private-mode is necessary for daily activities?
Q6 Do you like to drive private-mode (car or motorcycle)?
Q7 Do you think that public transport is expensive and has limited routes?

Part 3: Awareness of problem private-mode in society (APS).
Q8 Do you think that the private-mode (car or motorcycle) traffic could increase the accident rate in the city?
Q9 Do you think that congestion is getting worse in the city recently?
Q10 Do you think that emissions and noise are getting worse in the city recently?

Part 4: Inhibition of freedom of movement/less accessibility of the bus (IMA).
Q11 Do you think that the bus could reduce freedom/maneuver in the road traffic due to the use of large road space?
Q12 Do you think that the bus only serves limited routes/access?
Q13 Do you think that you would be decreased activities if using the bus?

Part 5: Correct and acceptable policy (CAP).
Q14 Do you think that the proposed bus reform is correct and acceptable policy?
Q15 Do you think that the proposed bus reform is a suitable policy to deal with traffic and environmental problem?

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