An empirical study of attitude towards C&DW recycling: Integrating social impression and environmental consciousness with theory of planned behaviour

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Outline

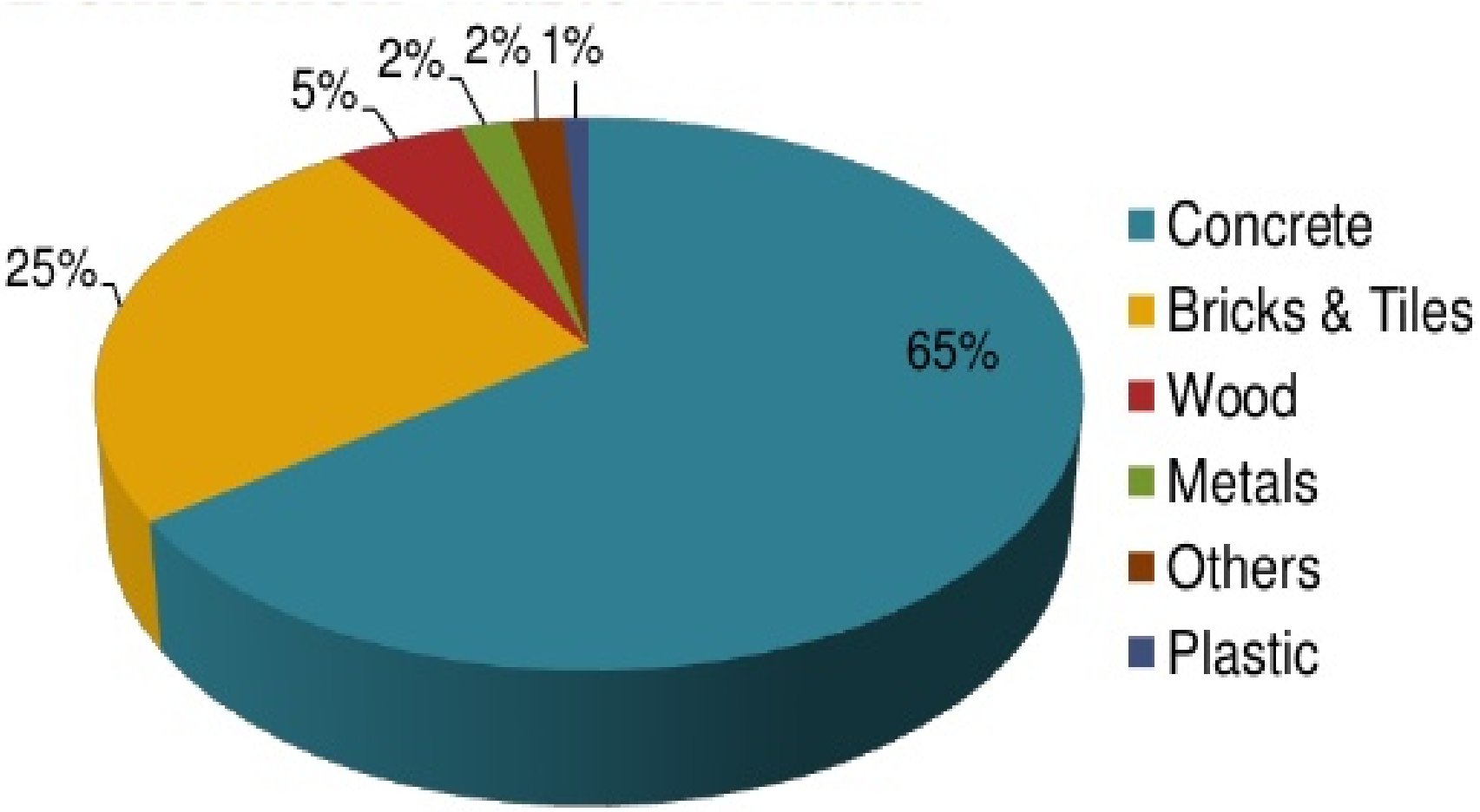
- Introduction
- Literature Review
- Conceptual Framework
- Methodology
- Results
- Discussion
- Conclusion

C&D Waste in India

- India generates over 65 million tons of C&D waste every year (BMTPC, 2016; TIFAC, 2001).
- Lack of formal waste management practices for managing C&DW.
- The traditional practice in India is to dispose of this waste in landfills or illegally dump in rivers and water bodies.

65% from Concrete, 25% bricks and tiles

Composition of C&D Waste in India



Source: Prof. S.K. Bhattacharyya, A.K. Minocha, Mridul Garg, Jaswinder Singh, Neeraj Jain, S. Maiti & S.K. Singh, GAP0072 (DST Project), Demolition Wastes as Raw Materials for Sustainable Construction Products, CSIR-CBRI News Letter,Vol-33 No-2 AprilJune 2013,pp. 1-2.

C&DW Recycling

- 70% of the construction industry is not aware of recycling techniques (TIFAC, 2001).
- There is a need for quality standards for recycled aggregate materials and recycled aggregate concrete to help setting targets for quality products and assure the user of a minimum quality requirement, thus encouraging him to use it.
- C&D Waste Management Rules 2016 were enacted by MOEF&CC (2016).
- Main emphasis on ‘hard’ factors
- Soft factors like social and behavioural issues are equally important.

Literature Review

Theory of planned behaviour

- Attitude
- Subjective norm
- Perceived behavioural control (Ajzen, 1991; Fishbein and Ajzen, 1975)

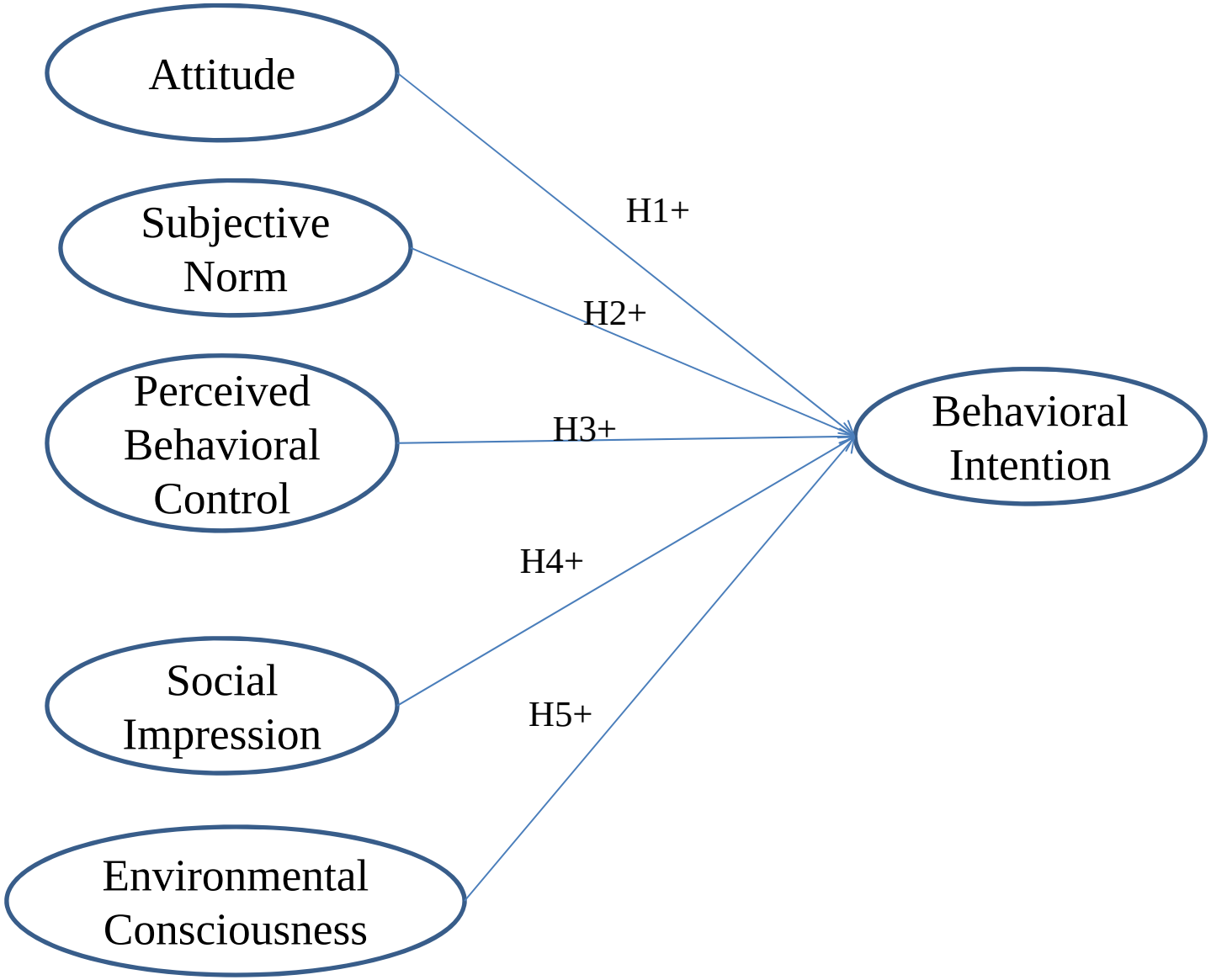
Social Impression

- Opinions and values earned by others (Chen and Hung, 2016)
- Social capital could influence citizens towards solid waste management (Jones et al, 2010)

Environmental Consciousness

- Environmental related factors that predicts human behavior (Chen and Hung, 2016; Iyer et al., 2016; Roberts and Bacon, 1997; Schlegelmilch et al., 1996; de Vicente Bittar, 2018).
- Environmental awareness and environmental behaviour profoundly impact solid waste management (Jones et al., 2010; Manowong, 2012)

Conceptual Framework



Methodology (Continued..)

- Questionnaire design
  - Two parts:
    - Qualifying (those who are aware of C&DW management practices); and
    - Main study (close ended questions pertaining to study's constructs).
- Face Validity, Pre-test and Pilot testing
  - Pretesting with 26 respondents
  - Pretest involving 7 academicians and 5 industry managers
  - Pilot study conducted with 45 respondents

Methodology (Continued..)

- Data collection:
  - Direct and indirect stakeholders of construction projects having knowledge of C&DW management were the target sampling frame for this study.
  - The data was collected from the respondents residing in South Delhi (India) though street intercept survey.
  - 204 valid responses from 240 responses resulting in response rate of 85%.

Methodology (Continued..)

- Statistical tool: Partial Least Squares Structural Equation Modelling
  - Theory building stage
  - SmartPLS 3 software (Ringle, et al. 2014).
  - PLS-SEM -a variance based approach has been used for examining the measurement and causal models (Hair et al. 2013; Peng and Lai, 2012; Henseler, Ringle, & Sinkovics, 2009)

Descriptive Statistics

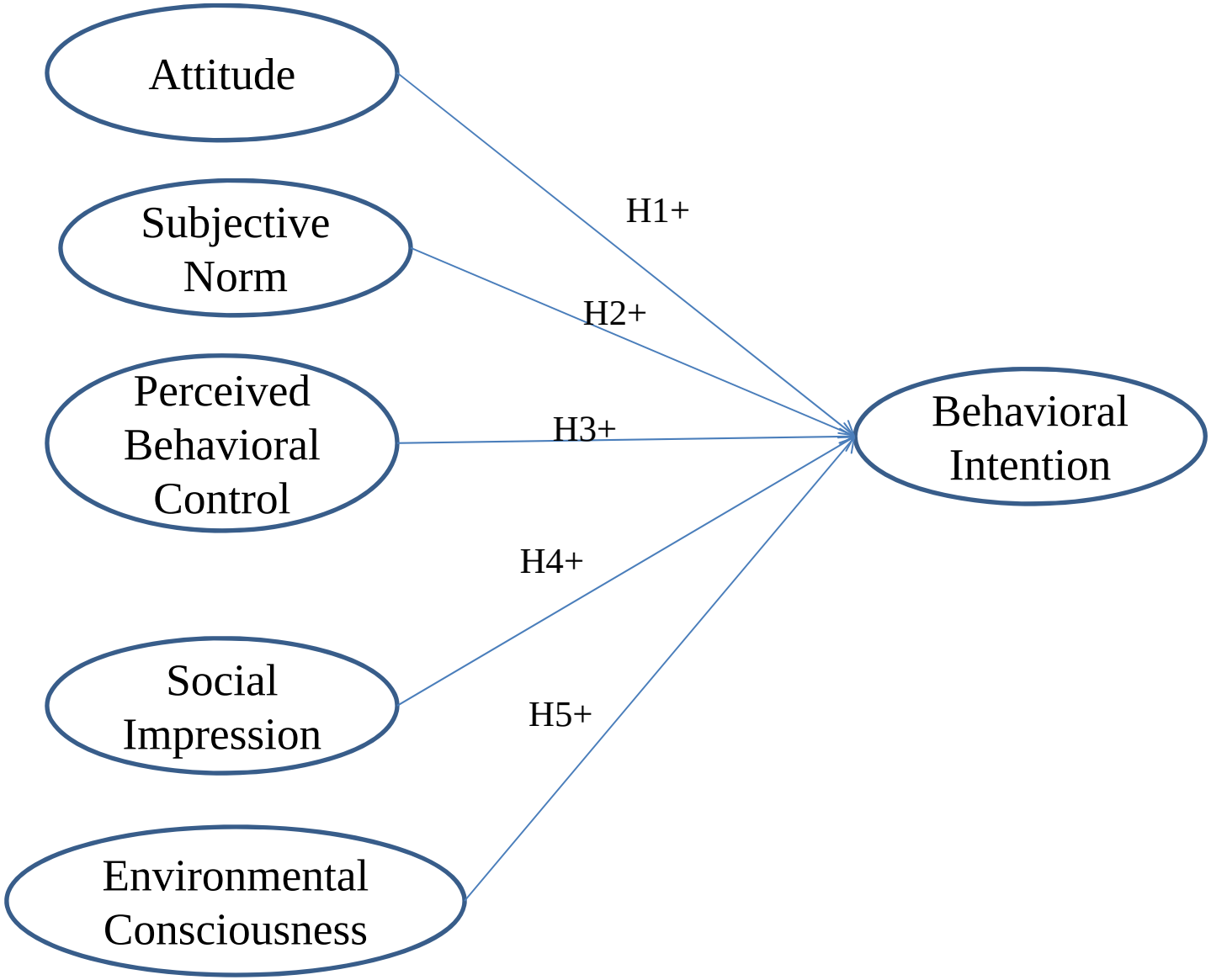
Demographics				
Gender	**Male**	**Female**		
Frequency	139	65		
Percentage	68.14	31.86		
Age	**<30 years**	**30-35 years**	**36-40years**	**> 40years**
Frequency	20	114	56	37
Percentage	8.81	50.22	24.67	16.3
Education	**Matriculation**	**Diploma**	**Graduation**	**Post-graduation**
Frequency	12	34	109	49
Percentage	5.88	16.67	53.43	24.02
Designation	**Manager**	**Engineer**	**Supervisor**	**Resident**
Frequency	16	50	50	88
Percentage	7.84	24.51	24.51	43.14

Validity and Reliability

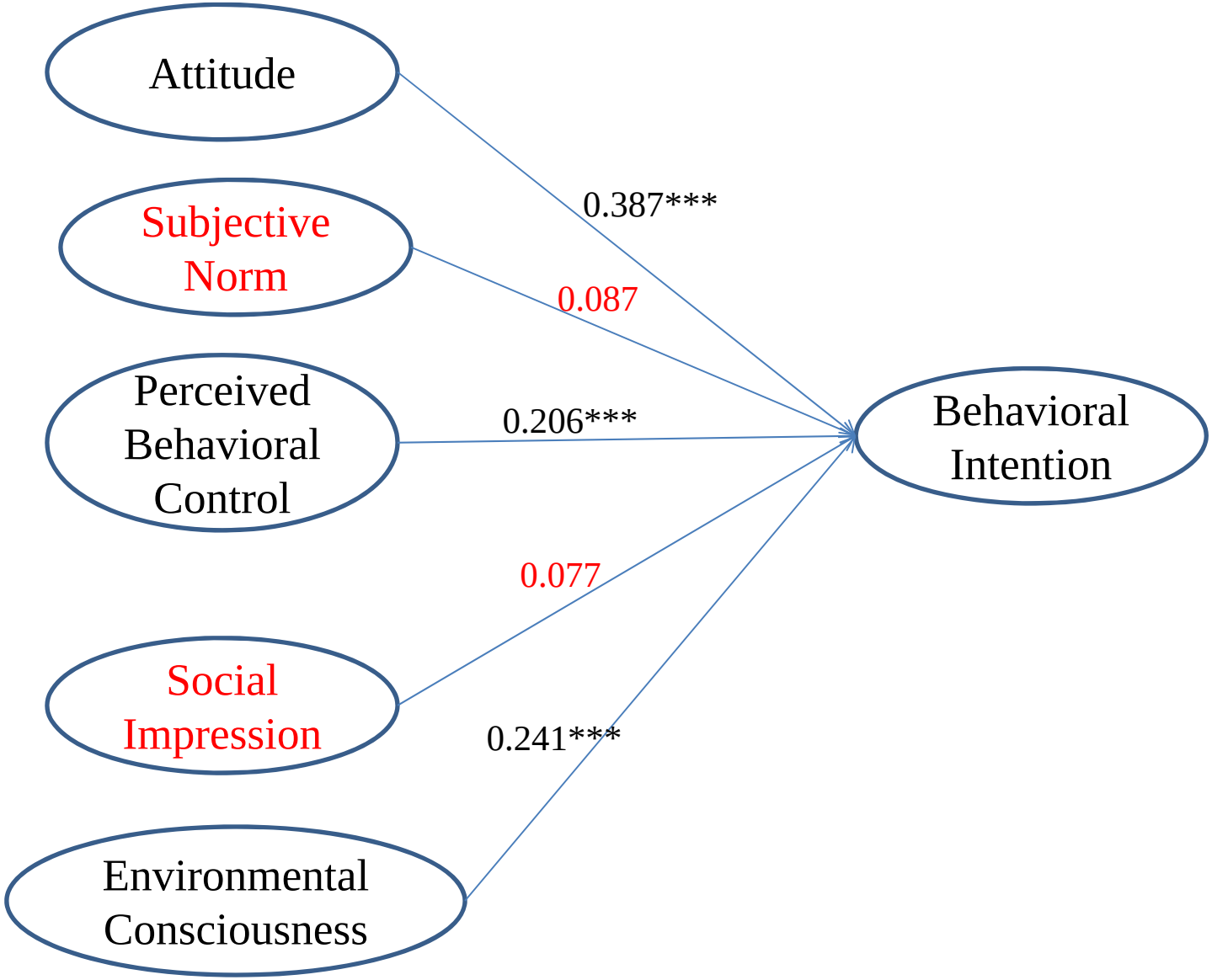
Construct	Cronbach's Alpha	CR#	AVE	ATT	SN	PBC	SI	EC	BI
ATT	0.799	0.869	0.627	0.792*					
SN	0.797	0.866	0.618	0.601	0.786				
PBC	0.831	0.887	0.663	0.381	0.320	0.814			
SI	0.808	0.873	0.633	0.389	0.383	0.473	0.796		
EC	0.854	0.889	0.534	0.630	0.629	0.473	0.470	0.731	
BI	0.808	0.874	0.634	0.699	0.534	0.477	0.566	0.673	0.797

*The off-diagonal values are the correlations between the latent variables, and the diagonal values are the square roots of the average variance extracted (AVE);
#CR: Composite Reliability ATT: Attitude; SN: Subjective norm; PBC: Perceived behavioural control; SI: social impression; EC: Environmental consciousness; BI: Behavioural intention

Conceptual Framework



Results


Attitude
Subjective Norm
Perceived Behavioral Control
Social Impression
Environmental Consciousness
Behavioral Intention
0.387***
0.087
0.206***
0.077
0.241***

Discussions & Managerial Implications

- Environmental Consciousness
  - Found to be positively and significantly related with behavioural intentions: In line with previously reported findings
  - If stakeholders have high environmental awareness or are aware about environmental issues related to C&DW, they are more likely to recycle C&DW
  - Information is a public good; Public provision of information becomes important: Role of governments in providing information about environmental impacts of C&DW and potential benefits from recycling C&DW

Discussions & Managerial Implications

- Perceived Behavioural Control (PBC) and Attitude
  - Found to be positively and significantly related with behavioural intentions: In line with previously reported findings
  - PBC linked with people's perception about ease/unease of a particular behaviour: Actions of individuals influenced by expected outcomes and their expectations of efficacy in achieving those outcomes
  - Attitude: a predictor of PBC
  - Environmental consciousness alone may not help: *external* and *internal* factors
  - For firms managing or looking to manage C&DW, PBC and attitude could be two skills that could be assessed for individuals assigned to decision making roles about C&DW

Discussions & Managerial Implications

- Subjective norms (SN) and social impression (SI)
  - Not found to be significantly associated with behavioural intentions: Contrary to previously reported findings (Jones et al., 2010; Manowong, 2012)
  - SN & SI related to societal perceptions, in turn related to societal norms
  - Low awareness about environmental issues, particularly related to C&DW in Indian society: related to low social expectations and low/nil social norms for C&DW recycling
  - Most of other studies have been done in western contexts: societies with high awareness about environmental issues
  - Possible interpretation: in countries that are less developed and have low public environmental awareness, SN and SI will not be significantly related with recycling behavioural intentions.

Discussions & Managerial Implications

- India is a growing economy: New infrastructure development: lots of activity expected in construction and demolition sector
- Our study positioned in the broader context of current Circular Economy, Resource Efficiency, and Sustainability debates in India
- Highlights importance of *soft* issues and not just *hard* issues.

Limitations and Future Scope

- This study measures perceptions of behavioural intentions towards C&DW recycling but could not measure actual behaviour.
- The cross –sectional data comprised stakeholders of North Central Region of India that raises concern on generalizability of the findings to other geographies of India.

Conclusion

- By focusing on the attitudes of stakeholders towards C&DW recycling by integrating social impression and environmental consciousness with the theory of planned behaviour, we aimed to understand the dynamics of C&DW recycling closely.
- Need to adopt an integrated approach improve to C&DW recycling where *soft* issues like environmental consciousness are considered equally important as *hard* infrastructural issues like recycling plants.
- The insights from our paper can also help the private sector understand the significance of various drivers of recycling behaviour.
- These insights can then be used by specific companies to align C&DW recycling with their SDG strategy.

Thank you ☺

Questions & Suggestions Welcome !