Hybrid Electric Vehicles: Driving Towards Sustainability  
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1. Introduction:

A great deal of interest in energy efficiency and social consciousness has been evidenced by the growing concerns associated with fuel consumption in automobiles, hence the development of sustainable vehicle technologies. Sustainable technologies are an articulation of sustainable development, whereby innovations need to adhere to the principles of social, economic and ecological sustainability to ensure the ability of future generations to meet their own needs (Mudler, Ferrer, & van Lente, 2011).

HEVs can be considered to be a more fuel-efficient alternative to conventional combustion automobiles that are powered by both fossil fuels (Khan & Kar, 2009). HEVs reduce fossil fuel consumption, produce fewer vehicle emissions, and have lower overall fuel costs (SEI, 2007). This study attempts to analyse the factors that may potentially affect intention to adopt Hybrid Electric Vehicles (HEVs).

The factors investigated in this study were the four dimensions of Unified Theory of Acceptance and Use of Technology (UTAUT) model (i.e. Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions), as well as three additional variables, in predicting the Intention to Adopt. The first additional variable was the Aesthetic Appeal of the HEVs. It was hypothesised that aesthetic appeal would add additional variance to the UTAUT factors in predicting the intention to adopt. The other two variables were predicting moderating influences.

The study sought to investigate whether Moral Justification (i.e. the ability to be able to morally dissociate from the possible negative impacts of fossil fuel use on the environment) and Environmental Concern would act as moderators between the UTAUT factors (and aesthetic appeal) and intention to adopt HEVs.

2. Method

With a sample consisting of 235 third year Engineering and Psychology students and utilising an adapted UTAUT model, a Semantic Differential scale for assessing Aesthetic Appeal, a Moral Justification scale, a Nature Relatedness scale, and an Intention to Adopt scale, multiple linear regressions were used to test the direct or interactional effects of Moral Justification and Environmental Concern on the relationship between all the subscales of the UTAUT model, Aesthetic Appeal, onto Intention to Adopt HEVs.

3. Results:

The UTAUT subscales presented with good internal reliability ranging from 0.6 to 0.8, as well as the Semantic Differential scale which proved to have acceptable internal consistency ($\alpha = 0.671$). The results revealed a significant direct effect of the UTAUT factors on Intention to Adopt HEVs ($p < 0.05$), with no significant effect of Aesthetic Appeal on intention ($p > 0.05$). The results also revealed significant interaction effects of Moral Justification ($\beta = 0.150, p < 0.05; \beta = 0.148, p < 0.05; \beta = 0.307, p < 0.05; \beta = 0.367, p < 0.05$) with the following R-squared scores for each of the three models 0.446, 0.445, 0.444. The results revealed no significant interaction effects of Environmental Concern ($\beta = 0.227, p > 0.05; \beta = -0.480, p > 0.05; \beta = -0.404, p > 0.05; \beta = 0.066, p > 0.05$) with the following R-squared scores for each of the three models 0.446, 0.445, 0.444.

4. Discussion

The results imply that Moral Justification has a contingent effect on the relationship between the UTAUT subscales and Aesthetic Appeal and Intention to Adopt HEVs, but not Environmental Concern. Indeed, the results found that environmental concern has a main effect on Intention to Adopt HEVs instead of
strengthening or weakening the relationship between the UTAUT factors and intention to adopt HEVs. To avoid potentially problematic high multicollinearity with the interaction terms, variables were centred and interaction terms between the independent and moderator variables were created (Aiken & West, 1991).

**Keywords**: Sustainability, Hybrid Electric Vehicles, Intention to Adopt, South Africa

**References**:


