Adoption Intention of Solar Energy as an Alternative Power Source for the Renewable Electricity Generation in Multan Pakistan: The Moderating Role of Social Media

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Abstract

In Pakistan, this study examines the intention to use solar energy as a renewable energy source, focusing on the moderating role of social media. The research has identified key factors influencing consumer intentions and the influence of social media on this process using a decomposed technology acceptance model as well as PLS (SEM). The discoveries show that individuals’ standards and their view of buyer viability decidedly affect natural worries and the stimulus for taking on Sunlight based PV innovation. The connection between private standards and purchasing aims is being directed by online entertainment. Consumer attitudes towards the adoption of solar energy are also significantly influenced by acceptance of consequences and a commitment to accountability. The study suggests that addressing consumer concerns through public awareness campaigns and effective warranty mechanisms can bolster confidence in solar technology. Furthermore, policymakers are encouraged to leverage subsidies and tax incentives to promote adoption and foster sustainable energy practices.

Keywords: Acceptance of Consequences, Ascription of Responsibility, Environmental Concern, Perceived Consumer Effectiveness, Personal Norms, Social Media, Intentions to Adopt PV Technology, Norm Activation Model (NAM)

JEL Classification: P28, D18

1. Introduction

In late many years, the idea of ecological maintainability and security has come to be a significant subject in examination and strategy plans because of environmental change as a key variable causing adverse consequences on worldwide financial turn of events. (Zhou, 2015,). The economy of Pakistan, with over 200 million people, is rapidly expanding and needs for power generation is continuing to increase. In order to meet its energy needs, Pakistan relies on fossil fuel reserves but due to the scarcity of these resources, there has been a growing divergence between supply and demand. (Frooq, 2013).

In Pakistan, renewable energy comes mostly from solar, wind, biomass, and biofuels. Their commitment to the energy blend of Pakistan is just somewhat over 1%, notwithstanding their
enormous assets. Sustainable power sources add to the decrease of ozone depleting substance outflows, giving green and environmentally friendly power (Ghafoor, 2015). In addition, for decades the energy sources of choice in the world have remained fossil fuels, i.e. coal and oil as well as biofuels like wood; megahyrdels or nuclear power plants (Hall, 2011).

The risks inborn in the continuation of the model of financial improvement in light of these sources, specifically the unreasonable utilization of petroleum products, are currently being perceived for more than one explanation (Arshad, 2018). One explanation is that the stores of non-renewable energy sources are not boundless, and, at the present utilization rate, they won't endure significantly longer. Today, what it took the earth a thousand years to make is being involved by the world local area in one moment (Coyle, 2014).

The fact that developing countries may not be able to tolerate excessive dependence on petroleum imports, marked by volatility in prices, has also been strongly highlighted (Irfan, 2020,). In addition, improper use of wood fuel leads to deforestation with consequences for the environment and results in an increased incidence of indoor air pollutions as well as adverse health effects on women and children, particularly due to inadequately burned wood fuel (Yasar, 2017). Similarly, the environmental impacts of other traditional sources of energy generation are negative (Amir, 2019) and (Yadav, 2016). In contrast, these two distinct values can be present in a person and may have an impact on their attitudes (Kareklas, 2014).

In order to overcome this shortcoming, we are studying the adoption of solar energy from an ethical pro environmental point of view based on a model of norm activation. One of the most beautiful descriptive models for measuring altruism is the norm activation model, NAM. Essentially, NAM claims that individual norms predict pro environmentalist behavior. (Schwartz, Normative influences on altruism., 1977).

In the communication of people all over the world, social media, Internet and Mobile Technologies are becoming important and effective tools. The role of social media for numerous social explanations, e.g. environmental purchases, environmentally responsible practices, recycled intentions or a reduction in processed food consumption, have been explored in the past studies (Wamuyu, 2018) (Trivedi, 2018).

However, there is still a lack of understanding in the literature on social media adoption for photovoltaic technology as compared to other technologies, particularly with regard to Pakistan, where about 71 million people are Internet users and 32 million use Facebook. Thus, by concentrating on the directing job of virtual entertainment in the connection between private standards and the reception of photovoltaic advances, this study plans to overcome this issue in writing.

Due to an increasing population and a high reliance on imported oil and gas, Pakistan has been experiencing serious energy shortages over the last decade. A high potential for renewable energy sources, in particular solar energy, is offered by the geographical location and climatic conditions of Pakistan. Solar power is the cleanest, most abundant renewable energy source available, and Pakistan has one of the world's largest solar sources (Pakistan, 2016).

In this context, there is growing support for exploring alternative sources of energy to conventional sources in order to ensure environmentally friendly sustainable development, on the one hand, and energy security, on the other. This research, based on the geological basis of Pakistan, has
shown that renewable energy foundations such as solar power are likely to become available in this country.

The study has added up to the already known literature and has also provided information to educate the public and influence policy direction as well. Moreover, it has also contributed to the awareness to choose renewable-to-electricity due to its cleanness and sustainability. These are following specific objectives of this study:

- Decrease reliance on the national grid for power supply.
- Cut down on electricity expenses by saving resources.
- Promote the adoption of solar energy via social media.
- Understand the process of installing solar panels.
- Advocate for the utilization of clean, renewable energy to mitigate greenhouse gas emissions

2. Literature Review:

2.1 The Energy Situation in Pakistan

Adequate and convenient access to energy is fundamental for enhancing the quality of life, creating job opportunities, and fostering economic development in any nation. The socioeconomic development of a country relies heavily on its energy supply, which is often regarded as the cornerstone of its economy. Developing nations such as Pakistan are grappling with significant energy challenges, which not only hinder economic growth but also contribute to long-term social and environmental repercussions (Bhutto, 2011).

Consequently, of the growing population and increasing vitality demand, Pakistan's electricity consumption increases every day by around 11 to 13 per cent. The primary sources of energy in Pakistan are fossil fuels such as coal, oil and gas, which are costly sources of energy with an almanac cost of almost seven million US dollars (Irfan, 2020,).

From lavish products like crude oil and gas, Pakistan produces about 61 percent of its electricity. However, since 2006 the country still faces a shortfall of approximately 14 to 18 hours of electricity in countryside areas and 8 to 10 hours in metropolitan areas (Ghafoor, 2015). To meet its energy needs, Pakistan imports almost 1.4 billion US dollars of petroleum derivatives which unfavorably affects monetary development in light of the fact that in 1996 it cost just 530 million US dollars (Uddin, 2016). In Pakistan, interest for energy is assessed to significantly increase by 2050 yet the power creation rate stays low and doesn't actually address the present issues in this nation (Asif, 2009).

The main reasons of energy crises in Pakistan are the lack of renewable energies, an increased reliance on coal and a lack of knowledge (Butt, 2013). In the meantime, the energy shortage is affecting all sectors in the country, but the textile sector is facing the maximum serious energy calamity in recent years; about 50 to 60 % of the textile sector has moved its activities to Bangladesh and China (Irfan, 2020,).

2.2 Norm Activation Model (NAM)

In a research, the model of standard enactment has been proposed by (Schwartz, 1977) and is extremely well known in the investigation of selflessness or ace environmentalism. Individual standards are viewed as the key build that drives sentiments or profound conditions of individual moral obligation regarding conduct with a certain goal in mind, as per standard enactment hypothesis (Schwartz, 2020). The NAM (Norm Activation Model) is widely regarded as a valuable framework for analyzing altruistic actions, primarily focusing on behaviors aimed at environmental conservation, such as energy-saving
The model includes three key factors: the attribution of obligation, familiarity with outcomes, and individual standards. The term "ascription of responsibility" (AR) refers to taking moral responsibility for the negative effects of not acting in an environmentally friendly manner (de Groot, 2009). Personal norms (PR) entail fulfilling moral obligations through specific actions, and within the norm activation model, they serve as a significant predictor of immediate pro-environmental behavior (Schwartz, 2020).

Awareness of consequences (AC) indicates whether an individual is cognizant of the negative impacts of their actions on society or mindful of values that are not aligned with pro-environmental principles (de Groot, 2009). Inside the NAM structure, the attribution of obligation and attention to results act as precursor factors for individual standards, impacting a person's conduct expectations, plans, or activities (Hopper, 1991).

Regrettably, the Norm Activation Model (NAM) solely considers internal factors, neglecting external influences. To enhance the model's explanatory capability, numerous researchers have augmented it by incorporating additional factors (Lv, 2016) (Peters, 2011). Furthermore, researchers have augmented the NAM by integrating supposed behavioral mechanisms as a precursor of personal models. This modification allows for a more comprehensive analysis of consumer behavior, providing deeper insights into the factors influencing individuals' actions and decisions (Klockner, 2009).

In another development within this area, a prolonged standard activation model was crafted by integrating external cost variables. This refinement aims to offer a more nuanced understanding of consumer choice behavior by considering the external costs associated with various options (Hunecke, 2001). While previous studies have emphasized the incorporation of external variables, many have neglected tending to irregularities in the connection between private standards and supportive of natural way of behaving (Jaini, 2019).

### 2.3 Environmental Concerns

Natural concern connotes the purchaser's overall direction or mentality towards ecological issues (Hunecke, 2001). Over the past few decades, there has been a significant and rapid occurrence of ecological changes, prompting many researchers to shift their emphasis towards ecological matters, particularly ecological behaviors or activities (de Groot, 2009). Environmental concern plays a pivotal role in determining the individual norms of customers towards engaging in ecologically friendly actions (Kim Y., 2005). Environmental apprehensions significantly influence a customer's decision to assume environmentally pleasant behaviors. Individuals who express greater apprehensions about environmental issues are more inclined to embrace and advocate for renewable energy foundations in order to protect the environment. Additionally, they are more likely to actively engage in eco-friendly activities themselves (Song, 2019). Therefore, we hypothesize that:

**H1:** Environmental concerns positively affect consumers' personal norms.

### 2.4 Perceived Consumer Effectiveness (PCE)

The idea of seen buyer viability (PCE) alludes to the mental peculiarity where purchasers show an uplifting outlook towards feasible and sustainable power sources as a way to safeguard the climate (Kinnear, 1974). As per the ongoing review, the conviction of the overall population that they can contribute and assist with conquering the adverse consequence of energy utilization on the climate
using environmentally friendly power sources, for example, biogas is characterized as seen purchaser productivity. A large portion of the scientists an affect shoppers’ perspectives, like their mentality and profound standards, for instance (Wesley, 2012) (Straughan, 1999). Consumers who care more about the environment are more likely to work for environmental sustainability and develop a positive attitude towards it (Kang, 2013). The personal standards of consumers can be activated by perceived consumer efficiency. It is thus likely that consumers will be more concerned about reducing environmental contamination when they think of their behavior as environmentally benign. PCE is quite possibly of the hugest and driving component in making sense of supportive of ecological buyer conduct and furthermore spurs purchasers to show an uplifting perspective towards the reception of maintainable choices of energy creation (Kang, 2013).

People can encounter delight when they participate in activities that safeguard the climate and feel remorseful when natural debasement happens because of their activities. This feeling of culpability adds to the development of good private standards. Therefore, we hypothesize that:

**H2:** Perceived consumer effectiveness positively affects consumers’ personal norms.

### 2.5 Moderating Role of Social Media

Given the logical inconsistencies found in the writing in regard to the connection between private standards and favorable to ecological way of behaving, it proposes the need of thinking about outer variables in this relationship (Jaini, 2019). This study uses social media as a moderating variable to better understand and strengthen relationships because pro-environmental behavior is influenced by other factors in addition to consumers' personal environmental responsibilities. Media channels, especially virtual entertainment, assume a significant part in dispersing adequate and precise data to teach society about their common ecological worries (Yu, 2017).

Social media has evolved into a crucial tool for communication, facilitating the expression of interests and the acquisition of information about ongoing events. It connects people globally, allowing them to gain insight into various occurrences. The widespread use of social media not only impacts individual interests but also influences consumer behavior (Wang T. , 2017). The social causes or defenses for green utilization conduct pushed by gatherings impact others to embrace comparable ways of behaving. Through online entertainment, the overall population can promptly notice the results of green ways of behaving, which persuades them to take part in supportive of ecological exercises. Moreover, research has found that virtual entertainment can improve correlation brain science and self-adequacy, the two of which add to advancing supportive of natural ways of behaving (Grevet, 2020) (Xu, 2019).

Research has uncovered that media channels straightforwardly impact buyers' mentalities and ways of behaving towards different ecological issues, including ozone depleting substance outflows, energy emergencies, and natural crumbling (Muralidharan, 2016). Although digital media has grown in popularity and power to facilitate direct actions or movements, its efficacy in changing the environment or putting environmental protection policies into action is still under investigation (Senbel, 2014) (Jaini, 2019). So, based on the above discussion it can be hypothesized that:

**H3:** Social media positively moderates the relationship between personal norms and people's intentions toward PV technology.
adoption of PV technology can then be influenced by his or her own standards.

3. Methodology

3.1 Proposed Methodology:
In order to collect the data, this study has been using a combination of quantitative and qualitative methods. Because the incidence of misconceptions is more acceptable to data collection using qualitative methods. If data needs to be more extensive, participation observation, interviews and reflections are better used.

3.2 Study site
Pakistan is currently grappling with energy shortages, and urban households rely on diverse energy sources to fulfill their electricity needs. However, this research focuses on Multan as a case study site for several reasons as Multan serves as a crucial economic center in Pakistan, but frequent electricity blackouts disrupt both business operations and household routines. Due to these challenges, households in Multan are actively seeking alternative, dependable sources of electricity. Additionally, Multan offers convenient access to suppliers and vendors of solar PV systems. The study targets both residential users and non-users of solar PV systems.

3.3 Sample and Procedure
(Hair J., 2016) presented a guideline for test size recommending a proportion of one to five. Given that this study’s questionnaire had 31 measurement items, a minimum of 155 functional questionnaires (31 x 5) were required. In this specific situation, a sum of 310 polls were circulated, with the family head filling in as the respondent. Data collection focused on the financial attributes of respondents and their perceptions regarding the convenience of using PV technology. The measurement items used in this research were adapted from various studies. All things used in this study were surveyed utilizing a five-point Likert scale, where one addressed "firmly clash" and five signified "emphatically concur." Things connected with attention to outcomes and attribution of obligation were
figured out in view of crafted by (Zhang Y., 2013). Items related to personal norms were sourced from (Smith, 2007). Items related to personal norms were sourced from (Wang Z., 2017). Items related to personal norms were sourced from (Kim Y., 2005). Items of social media were adopted by (Sujata, 2019) and (Oakley, 2014).

Households chosen for interviews comprised both users and nonusers of solar PV systems to obtain a comprehensive understanding of the factors influencing solar PV diffusion. Interviewees were selected based on their responsibility for household decisions regarding solar PV adoption. Additionally, efforts were made to select interviewees from various areas of Multan to ensure comprehensive coverage of households across different socioeconomic conditions, considering the reluctance of individual households to disclose their monthly average income. Therefore, for mixed sample of different socio economic types of households, WAPDA Town, Defense Housing Authority, Model Town, Zikariya Town, Butch Villas, Gulgasht colony, Sahar villas, Shalimar Colony were included in this study. The demographical data has been shown in figure 1.

4. Analysis and Results
4.1 Empirical Strategy and Results

Underlying Condition Displaying (SEM) is a complex multivariate measurable strategy utilized to evaluate primary connections among factors (Hair J. F., 2014). Primary Condition Displaying (SEM) is a modern multivariate factual strategy utilized to evaluate underlying connections among factors (Richter, 2016). SEM incorporates different exact tests, including factor investigation, discriminant examination, and relapse or way investigation, to investigate the underlying connections among noticed and idle factors (Chin, 1998).

In the fields of Social Sciences and Behavior Studies, SEM's ability to evaluate a relationship between exogenous and endogenous variables at the same time is highly sought after (Cheah et al., 2019) (Ali, 2019). Because of its ability to analyze complex relationships within models, PLSSEM, often referred to as "the Silver Bullet" or "the Holy Grail", is preferred by researchers (Hair J. F., 2011). Considering these favorable empirical characteristics, we chose to utilize PLS-SEM for our data analysis, employing Smart PLS 3.0 software (Ringle, 2015). A double stage evaluation, including the assessment of both the estimation model and the primary model, has been utilized in our way to deal with PLSSEM. Tests for legitimacy and develop unwavering quality were remembered for the assessment of the estimation model as well as a primary model's evaluation, which was centered on inspecting the meaning of those speculations.
4.2 Measurement Model-Based Assessment

The reliability and validity of the construction shall be assessed in order to evaluate the measurement model. Construct reliability is measured through a composite reliability analysis of items assessed on the basis of external loadings, as well as internal consistency and durability (Akbar et al., 2019). All external loadings meet the suggested edge of 0.5 (Hair J. F., 2014). Additionally, composite dependability outperforms the limit worth of 0.7, and AVE surpasses the cut-off worth of 0.5 (Anderson, 1988).

Table 1. Measurement model-based assessment.

<table>
<thead>
<tr>
<th>First-Order Construct</th>
<th>Second-Order Construct</th>
<th>Items</th>
<th>Loadings</th>
<th>AVE</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance of consequences</td>
<td>AOC1</td>
<td>0.649</td>
<td>0.588</td>
<td>0.809</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOC2</td>
<td>0.853</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOC3</td>
<td>0.784</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascription of Responsibility</td>
<td>AOR1</td>
<td>0.805</td>
<td>0.649</td>
<td>0.847</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOR2</td>
<td>0.872</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOR3</td>
<td>0.734</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment Concern</td>
<td>ENC1</td>
<td>0.868</td>
<td>0.572</td>
<td>0.796</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENC2</td>
<td>0.786</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENC3</td>
<td>0.588</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Norms</td>
<td>AOC</td>
<td>0.850</td>
<td>0.635</td>
<td>0.871</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOR</td>
<td>0.861</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENC</td>
<td>0.839</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PerceivedConsumer Effectiveness</td>
<td>PCE1</td>
<td>0.626</td>
<td>0.586</td>
<td>0.807</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCE2</td>
<td>0.864</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCE3</td>
<td>0.786</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Media</td>
<td>SLM1</td>
<td>0.669</td>
<td>0.616</td>
<td>0.827</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SLM2</td>
<td>0.848</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SLM3</td>
<td>0.826</td>
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</tr>
</tbody>
</table>

HTMT is viewed as the most dependable technique for surveying discriminant legitimacy, considering that the aftereffects of the Fornell-Larcker rules are still under banter (Hair J. F., 2014). Thus, the HTMT rules were utilized to assess discriminant legitimacy proposed by (Gold, 2001) he further recommended that HTMT values outperforming 0.90 may recommend potential legitimacy concerns. Conversely, (Kline, 2015) suggests that values surpassing 0.85 may raise concerns in regard to discriminant legitimacy. All values are below 0.85, as shown in Table 2, which meets the criteria for discriminant validity.
Table 2. Heterotrait–Monotrait (HTMT).

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>PCE</th>
<th>ECO</th>
<th>ENV</th>
<th>INS</th>
<th>IN</th>
<th>PEOU</th>
<th>PU</th>
<th>SOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>DIS</td>
<td>0.775</td>
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<td></td>
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<td></td>
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<tr>
<td>ECO</td>
<td>0.717</td>
<td>0.776</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ENV</td>
<td>0.559</td>
<td>0.674</td>
<td>0.717</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INS</td>
<td>0.688</td>
<td>0.652</td>
<td>0.611</td>
<td>0.619</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>IN</td>
<td>0.720</td>
<td>0.865</td>
<td>0.741</td>
<td>0.703</td>
<td>0.703</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>0.692</td>
<td>0.631</td>
<td>0.635</td>
<td>0.624</td>
<td>0.703</td>
<td>0.834</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PU</td>
<td>0.775</td>
<td>0.758</td>
<td>0.639</td>
<td>0.516</td>
<td>0.576</td>
<td>0.808</td>
<td>0.791</td>
<td></td>
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<tr>
<td>PP</td>
<td>0.570</td>
<td>0.530</td>
<td>0.578</td>
<td>0.560</td>
<td>0.560</td>
<td>0.543</td>
<td>0.603</td>
<td>0.589</td>
<td></td>
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<tr>
<td>SOM</td>
<td>0.755</td>
<td>0.731</td>
<td>0.866</td>
<td>0.738</td>
<td>0.714</td>
<td>0.865</td>
<td>0.721</td>
<td>0.648</td>
<td>0.520</td>
</tr>
</tbody>
</table>

4.3 Structural Model-Based Assessment

After the first step, which involved evaluating the measurement model, was finished, a structural model was built in the second stage. The appraisal of the primary model incorporates analyzing way coefficients (β values), t-values, coefficient of assurance (R²), impact size (f²), and prescient significance (Q²). β values were resolved utilizing the bootstrapping strategy with 5000 resamples. The experimental outcomes demonstrate the acknowledgment of each of the four speculations (Table 4 and Table 5). The discoveries uncover that consciousness of results (β = 0.292, t = 6.208 > 1.64, p < 0.05), attribution of obligation, and ecological concern (β = 1.243, t = 28.503 > 1.64, p < 0.05) fundamentally influence individual standards. Personal norms also have a significant impact on consumers' intentions to purchase solar PV technology (= 0.504, t = 14.788 > 1.64, p < 0.05).

Similarly, the relationship between personal norms and intentions to adopt PV technology is moderated by social media (= 0.088, t = 3.242 > 1.64, p < 0.05). The coefficient of assurance (R²) addresses the extent of change in the reliant variable made sense of by the free factors in a specific model. In this model, the R² esteem is 0.402. This shows that the model has huge illustrative capacity, predictable with the idea by (Cohen, 1988) that a R² esteem surpassing 0.40 is thought of as significant. The impact size f² indicates the extent of the effect of exogenous factors on endogenous factors (Hair J. F., 2014). As per (Cohen, 1988), impact sizes (f²) underneath 0.02, somewhere in the range of 0.02 and 0.15, or more 0.35 show little, medium, and enormous impacts, separately. Table 5 shows that all factors display changing impact sizes, going from medium to huge. Besides, the worth of Q2 surpassing 0 (Q² = 0.345) demonstrates that the model has prescient importance.

Table 3. Structural model Assessment.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Path Coefficient</th>
<th>Std. Error</th>
<th>t Value</th>
<th>p-Value</th>
<th>Supported</th>
<th>R²</th>
<th>Q²</th>
<th>f²</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>AC-&gt;ATT</td>
<td>0.292</td>
<td>0.047</td>
<td>6.208</td>
<td>0.000</td>
<td>Yes</td>
<td>0.218</td>
<td>0.100</td>
<td></td>
</tr>
<tr>
<td>H2</td>
<td>AR-&gt; ATT</td>
<td>1.243</td>
<td>0.044</td>
<td>28.503</td>
<td>0.000</td>
<td>Yes</td>
<td>1.819</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3</td>
<td>ECC-&gt; PN</td>
<td>0.504</td>
<td>0.034</td>
<td>14.788</td>
<td>0.000</td>
<td>Yes</td>
<td>0.402</td>
<td>0.362</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Structural Model Assessment (Moderation).

<table>
<thead>
<tr>
<th>Moderation</th>
<th>(β)</th>
<th>(STDEV)</th>
<th>T Statistics</th>
<th>p Values</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4. ELC*SOM-&gt;INT</td>
<td>0.088</td>
<td>0.045</td>
<td>3.242</td>
<td>0.000</td>
<td>Supported</td>
</tr>
</tbody>
</table>

4.4 The Moderating Role of Social Media

The directing impact of web-based entertainment is evaluated through the connection term between private standards and buy aim, which is viewed as genuinely critical in the model ($\beta = 0.088$, $t = 3.242 > 1.64$, $p < 0.05$). The $R^2$ value changes when the moderating variables are incorporated into the proposed model. The $R^2$ esteem increments from 0.402 to 0.412, demonstrating that together, attention to results, attribution of obligation, and online entertainment can make sense of 41.2% of the variety in the endogenous variable (Shopper reception goal). This finding recommends that the model records for extra variety in reception expectation subsequent to thinking about the impact of online entertainment, albeit the thing that matters isn't significant, causing varieties in the buy aim of the examined consumers is adequate.

5. Discussion

The heightening energy utilization and the related ecological dangers, combined with the consumption of regular assets, feature the basic of embracing environmentally friendly power sources to advance supportable monetary turn of events. The moderateness, proficiency, and potential for supportable energy creation make sun oriented photovoltaic (PV) innovation an undeniably engaging choice for both policymakers and researchers.

Notwithstanding Pakistan's bountiful sun-oriented energy assets, the take-up of sun-based PV innovation stays languid. Hence, we utilize a decayed innovation acknowledgment model to acquire an exhaustive comprehension of buyers' goals with respect to the reception of sun-oriented PV innovation in Pakistan. Through the use of Halfway Least Squares Underlying Condition Displaying (PLS-SEM), our review uncovers that natural worries and saw customer viability emphatically impact personal norms, which thusly influence purchasers' aims to take on sunlight-based PV innovation. In addition, our findings indicate that social media moderates the relationship between personal norms and solar PV technology purchase intent.

As anticipated, the discoveries exhibit a critical relationship among the exogenous and endogenous factors inspected in this review, prompting the dismissal of every invalid speculation. Additionally, the observational outcomes affirm that apparent customer adequacy (PCE) impacts shopper mentalities toward the reception of sun-based PV innovation. This suggests that, in comparison to alternative energy sources, Pakistani households are more likely to adopt solar PV technology when they consider it to be environmentally friendly, socially acceptable, and economically advantageous. Value responsiveness is a basic variable impacting shopper conduct, especially in non-industrial countries like Pakistan. Pakistani consumers are price-sensitive and place a high value on value when making purchasing decisions. In addition, consumers look for energy options that are better for the environment because of the complicated environmental issues that developing nations face.

This finding lines up with past examination on green utilization in Pakistan, which recommends that people are leaned to embrace items that proposition an incentive for cash, are harmless to the ecosystem, and line up with their societal position and companion bunch inclinations. Public policy and awareness campaigns should promote solar PV technology as an environmentally friendly and cost-effective solution in order to capitalize on these findings. By accentuating its cultural acknowledgment
and incentive, the reception pace of such advances can be upgraded, at last prompting diminished use for shoppers contrasted with elective energy sources.

The degree to which consumers are willing to accept the outcomes associated with using or comprehending new technology is referred to as acceptance of consequences (AOC). Consumer attitudes toward adopting solar PV technology are positively correlated, according to the empirical findings. This lines up with past exploration proposing that shoppers are more disposed to take on green advances when they are easy to use. On the other hand, AOC related to the adoption of solar PV technology is negatively impacted by feelings of insecurity and discomfort. This recommends that people who experience weakness and distress while utilizing new innovation might be less inclined to embrace it. To address this, administration divisions ought to carry out open mindfulness and prepare projects to acclimate individuals with the utilization of such energy items. In addition, providing installation guides and product manuals can make it easier to set up and use these technologies.

Utilizing web-based entertainment stages can likewise be viable in accomplishing this objective (Menegaki, 2012). Moreover, a successful guaranteed component for sunlight-based PV items can assist with easing purchasers' interests about distress and uncertainty.

Attribution of obligation alludes to shoppers' convictions and sentiments about utilizing sun-oriented PV innovation. The outcomes show that shoppers' attribution of obligation essentially impacts their buy expectations in regard to sun powered PV innovation in Pakistan. Further it is also found via research carried out in a variety of nations, including Malaysia and European nations, despite the fact that there is a limited body of literature on this subject. This recommends that once an uplifting outlook is created, customers are bound to buy sun powered PV items. Customers' decisions to adopt new technology are frequently influenced by external factors like social media, according to researchers. In this manner, the concentrate likewise looks at the directing job of web-based entertainment in the connection between credit of liability and buy expectations.

Furthermore, observational tests looking at control demonstrate that virtual entertainment (SOM) fundamentally directs this relationship, with a detailed one percent increment in R2. Albeit the balance impact is little, it is considered huge with regards to this review. The government must come up with effective policies that make it easier for consumers to make decisions in developing nations like Pakistan. For example, offering endowments to shoppers who buy sun-oriented PV innovation could be a practical system. Additionally, solar PV manufacturing companies might be eligible for tax breaks, allowing them to sell their products at a lower price in Pakistan. These sponsorships, alongside charge impetuses and a steady administrative climate, would make ideal circumstances for energy organizations working in the sunlight-based PV area. Thus, the inescapable reception of sun-oriented PV innovation wouldn't just alleviate ecological issues yet in addition support the public authority's ability to fulfill the developing need for family energy. In the end, the use of solar photovoltaic (PV) technology has the potential to be a cost-effective and long-lasting source of energy that will benefit both households and the government.

6. Conclusions and Policy Implications
Expanding the portion of environmentally friendly power in the general energy blend is essential for cultivating maintainable advancement in an economy. In addition, developing economies like Pakistan's can significantly benefit from the implementation of renewable energy technologies (Wang Y. Z., 2020).
The discoveries demonstrate that natural preservation conduct (ECB) and acknowledgment of results (AOC) decidedly and fundamentally impact individual standards with respect to sun-oriented PV innovation reception. Customers' intentions to use solar PV technology are also positively influenced by responsibility. In addition, the relationship between individual norms and purchase purpose originated to be moderated by social media. The persistent demand-supply gap in the energy sector and Pakistan's acute energy crisis are both responsible for these outcomes. Adoption of solar photovoltaic (PV) technology is seen as a viable option for bridging this energy gap because of its low cost and positive effects on the environment. As a result, Pakistani household consumers show a desire to adopt this technology, albeit at a slower rate than in other developing nations in the region.

The ongoing review offers significant down to earth and hypothetical experiences; however, it likewise presents a few impediments. First, little is known about how social demographics affect consumer decision-making. Future exploration could consolidate segment factors as control variables to all the more likely comprehend sun-based PV reception in creating economies. Furthermore, zeroing in exclusively on family purchasers disregards potential stockpile side imperatives. Investigating such imperatives could give important experiences into advancing sunlight-based PV advancements. Thirdly, while expectations are demonstrative of conduct, there might be disparities between goal and real reception. Consequently, future investigations could dive into shoppers' genuine buying conduct in regard to sun-based PV innovation, overcoming any issues among aim and activity.

References:


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