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Technological opinion leadership: The role of personal innovativeness, gadget love, and technological innovativeness

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ABSTRACT

This study contributes to existing literature by developing and testing a model of factors that drive technological opinion leadership (TOL). We expand Bruner and Kumar's (2007) study by empirically testing the relationships between technological innovativeness and technological opinion leadership and between gadget lovers and technological innovativeness using a student sample and a national sample. We also contribute to the literature by (a) testing the relationships between personal innovativeness, technological innovativeness, and gadget lovers, and (b) investigating the mediational role of gadget lovers between personal innovativeness and technological innovativeness.

Results indicate: (1) technological innovativeness and gadget lovers are predictors of technological opinion leadership, (2) personal innovativeness is positively related to technological innovativeness and gadget lovers, and (3) gadget lovers partially mediate the relationship between personal innovativeness and technological innovativeness. Implications for managers and scholars are provided based on the two studies' results.

1. Introduction

High-tech gadgets, such as iPad Air and Combi Monitor are becoming a part of everyday life. As technology advances, the acceptance of new gadgets advances in the marketplace as well. These innovative/novel products not only solve problems older products have but also provide new benefits, attributes, and functions for consumers.

Though research on innovation exists, the literature mainly focuses on the adoption and diffusion of innovation (Bartels & Reinders, 2011; Hauser, Tellis, & Griffin, 2006; Rogers, 1995). Most studies focus on the characteristics innovative products have that enhance diffusion into the marketplace. There is, however, scant research related to the constructs that serve as predictors of technological opinion leadership (TOL). Within the marketing field, we are aware of only two studies, Bruner and Kumar (2007) and Rogers (2003), which discuss the notion of technological opinion leadership.

In the literature, there are also studies on opinion leadership as a global construct. For example, Schiffman and Kanuk (2007) deal with the motivational factors of opinion leaders. Ruvio and Shoham's (2007) study showcases the importance of new product/brand usage, information seeking, and risk taking as important attributes of opinion leaders. However, few studies research the constructs that serve as predictors for domain specific opinion leadership, e.g., technological opinion leadership.

This study contributes to the existing literature by integrating and testing a model of TOL built around and extending beyond the predictors of opinion leadership that exist in literature. More specifically, we empirically test two constructs, technological innovativeness and gadget lovers, which are not tested for their effect on TOL in Bruner and Kumar's (2007) study. We also study the relationship between gadget lovers and technological innovativeness.

Beyond extending Bruner and Kumar's study, this study also contributes to the literature by (a) empirically testing the relationships between personal innovativeness, technological innovativeness, and gadget lovers and (b) examining the mediational role of gadget lovers between personal innovativeness and technological innovativeness.

We first review existing literature, which includes factors that motivate individuals toward technological innovativeness and technological opinion leadership, then develop the hypotheses based on these factors. The methodology used for this study is described, followed by the presentation of findings. The results are discussed, and implications for managers and scholars are followed by limitations and suggestions for future research.

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2. Literature review and hypotheses development

2.1. Technological opinion leadership (TOL)

The construct of opinion leader originates from the work of sociologists Lazarsfeld, Berelson, and Gaudet (1948). In the 1960s, Rogers, and others who placed the term in the context of theories of diffusion of innovation in the marketplace, expands the idea Lazarsfeld and his colleagues proposed about opinion leaders. According to Rogers and Cartano (1962), "opinion leaders exert an unequal amount of influence on the decisions of others" (p. 435). These leaders assume an important role in providing information and leadership to others as they make consumption decisions (Childers, 1986). Opinion leaders are influential members of a community, group, or society to whom others turn for advice, opinions, and views. They have the ability to influence public opinion because they are not only knowledgeable but also highly respected for their expertise. According to Goldberg, Lehmann, Shidlovski, & Barak (2006), opinion leaders are either experts, people who have a wide knowledge and understanding of a specific product category or social connectors, people who have many connections and tend to engage others (Goldberg et al., 2006). Whether socially, politically, or economically, opinion leaders exist in all areas of society (Katz & Lazarsfeld, 1955). However, technological opinion leadership is a more domain specific construct (Rogers, 2003), meaning a leader's expertise and influence are usually related to a specific area of influence. Thus, technological opinion leaders are expert connectors.

Technological opinion leaders are individuals who attempt to influence peoples' opinions and their purchasing behaviors in a specific product field. These opinion leaders tend to be less dogmatic (Goldsmith & Goldsmith, 1980), more innovative (Myers & Robertson, 1972), and they possess an affinity for technology (Geissler & Edison, 2005). They tend to be highly competent regarding the use of new high-tech products and have an impact on others' attitudes and actions. For this study, *technological opinion leaders* are defined as consumers who provide information to other consumers and influence their purchase decisions for technological products (Bruner & Kumar, 2007).

Although technological opinion leadership (TOL) is a fast emerging phenomenon, there is limited research on this domain specific area. The few research studies conducted in domain specific opinion leadership areas deal with issues like diffusion of new drugs (Iyengar, Bulte, & Valente, 2010) and technology (Bruner & Kumar, 2007). Bruner and Kumar (2007) found the existence of a strong relationship between gadget lovers and TOL, whereas Rogers (2003) indicated the importance of opinion leaders in the diffusion of technological innovations in a social network.

Excluding the Bruner and Kumar (2007) and Rogers (2003) studies, we have not been able to identify studies that address technological opinion leadership.

2.2. Personal innovativeness (PI)

Agarwal and Prasad (1998) define *personal innovativeness* as a risk taking propensity that arises in certain individuals and not in others. These individuals are willing to take chances and to try new things and are able to cope with high levels of uncertainty (Bruner, Hensel, & James, 2005). The construct personal innovativeness has an extensive presence in innovation diffusion research, as Rogers (1995) mentions, and in the domain of marketing specifically (e.g., Midgley & Dowling, 1978; Flynn & Goldsmith, 1993; Agarwal & Prasad, 1998). In marketing literature, this construct is used for segmenting consumers into "innovators" and "non-innovators."

The literature describes personal innovativeness as *global* or *general innate innovativeness*, a more abstract level than realized or actualized innovativeness (Midgley & Dowling, 1978; Flynn & Goldsmith, 1993; Agarwal & Prasad, 1998). According to Midgley and Dowling (1978), innovativeness is "a function of dimensions of human personality" (p. 235), and it is possessed by all individuals to a greater or lesser degree. Both theoretically and empirically, personal innovativeness is seen as a key variable in the innovation adoption process. Literature demonstrates the direct positive relationship between personal values and innovativeness (Hartman & Samra, 2008). Similarly, other studies (e.g., Leonard-Barton & Deschamps, 1988) also showcase personal innovativeness, an individual's receptivity toward change, as an important determinant in new technology adoption and innovation success.

Past studies show personal innovativeness, also labeled as global innovativeness - a more abstract level of innovativeness, as positively correlated with domain specific innovativeness (Bartels & Reinders, 2011). Consistent with the literature, this study accepts an individual's receptivity toward taking chances or trying new things should lead to his/her desire for innovativeness toward technological goods. Personal traits, such as an individual's openness-to-take chances, may be a better indicator of their innovativeness.

Based on the above statement, it is expected individuals who like to take chances and experiment with new ways of doing things should be motivated to be the first to own or adopt a new technology-based good or service, a concept known as technological innovativeness (Bruner & Kumar, 2007). Thus, we hypothesize:

H1. *Personal innovativeness is positively related to technological innovativeness.*

Personal innovativeness is a personality trait associated with risk taking individuals. Gadget lovers are consumers with a high intrinsic motivation to adopt and use a variety of leading-edge technology-based goods, and they can be presumed to be challenge seekers because they enjoy experimenting with leading edge technological goods/high-tech products where a certain level of uncertainty is involved. In general, personal innovativeness, characterized by a risk taking propensity and ability to cope with uncertainty, is more salient in gadget lovers who are presumed to be knowledgeable about gadgets. By using the new gadgets, they become more knowledgeable about them, enhancing their coping skills to handle new technology and the uncertainties or challenges that may arise while using them. The ability to cope with uncertainty allows gadget lovers to generate a high intrinsic motivation that drives them to use a variety of leading edge technological goods, as well as the services that complement them (Bruner & Kumar, 2007). Gadget lovers are willing to take on the challenge because new technology provides new benefits, features, and functions, and the usage of these high-tech goods excites them while enhancing their knowledge. Leonard-Barton and Deschamps (1988) conceptualize individuals who are willing to take challenges are more likely to adopt and/or use new products or services. Similarly, one can argue individuals who are willing to take chances are more likely to use leading edge technological goods and high-tech products, such as iPad Air, Combi Monitor, etc. Thus, we hypothesize the following:

H2. *Personal innovativeness is positively related to gadget lovers.*

2.3. Technological innovativeness (TI)

Technological innovativeness is more *domain specific* innovativeness, i.e., innovativeness within a specific domain of interest such as technological goods (Flynn & Goldsmith, 1993). Goldsmith and Hofacker (1991) first launched the idea of domain-specific innovativeness, and this concept has been applied in different domains such as fashion (Goldsmith, Kim, Flynn, & Kimm, 2005), consumer products (Goldsmith & Flynn, 1992), and information technology (Agarwal & Prasad, 1998; Agarwal & Karahanna, 2000). Domain specific innovativeness is important because it predicts innovative consumer behavior more accurately (Leavitt & Walton, 1975).

The literature defines *Technological innovativeness* as the extent to which a consumer is motivated to be the first to adopt new

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technology-based goods and services (Bruner & Kumar, 2007). Studies show domain specific innovativeness captures an individual's predisposition toward a product class within a specific domain of interest, such as technological innovativeness, significantly more than global innovativeness (Roehrich, 2004).

Consumer behavior literature also showcases a significant correlation between product involvement and opinion leadership (Richins & Root-Shaffer, 1988). Feick and Price's (1987) study finds "product involvement to be the predominant explanation for opinion leaders' conversations about products" (p. 84). Similarly, studies in marketing and innovation literature indicate innovativeness within a specific domain of interest is positively correlated to opinion leadership in a specific product field (Bartels & Reinders, 2011; Shoham & Ruvio, 2008; Goldsmith & Hofacker, 1991).

In accordance with the previous statement, the argument consumers' innovativeness with a specific area, like technological goods, would trigger consumers' interests in other novel products and increase their involvement with and knowledge of the products appears plausible. Once consumers gain more knowledgeable about high-tech products or services, then also gain confidence in sharing their experiences and information with others and shaping others' opinions in favor of purchasing the products and services they approve. Thus, we hypothesize the following:

H3. *Technological innovativeness is positively related to technological opinion leadership.*

2.4. Gadget lovers (GL)

Marshall McLuhan (1964) originally coined the term "gadget lovers." For this study, the definition of gadget lovers has been construed from Bruner and Kumar's (2007) study where they define *gadget lovers* as "consumers with high intrinsic motivation to adopt and use a variety of leading-edge technology-based goods, as well as the services that complement them" (p. 330).

To understand the characteristics of gadget lovers, Bruner and Kumar conduct a focus group, two national studies, and two supplementary studies. The results from their research identify some of the key characteristics of gadget lovers: enjoy playing with gadgets, figure out how the technology works and become knowledgeable about their devices, spend a considerable amount of time and effort determining what the gadgets can do, and find it thrilling to play with products that have high technology components. Therefore, one can conclude these consumers have high intrinsic motivation and are perceived as more knowledgeable and creditable about high-technology products.

Gadget lover is a personality trait like characteristic (Bruner & Kumar, 2007). These consumers use high-tech products because they are usually fascinated by the new and attractive attributes of high-tech goods. These people are willing to take chances and to try new technological goods because of their new benefits, features, and functions. Usage of these leading edge technological goods brings them a great amount of enjoyment, as the novel characteristics in high-tech products stimulate or excite these lovers of technology (Shoham & Pesamaa, 2013). They also motivate them to adopt new-technological products earlier than other consumers. Thus, we hypothesize the following:

H4. *Gadget lovers is positively related to technological innovativeness.*

The risk taking propensity and ability to cope with uncertainties encourage people with personal innovativeness to take chances and to try new gadgets. Because gadget lovers are stimulated by the new novelties of high-tech gadgets, they are eager to take a chance with using these novel products and to become early adopters of the leading-edge technological goods and services that complement them (Shoham & Pesamaa, 2013). Accordingly, the enthusiasm of gadget lovers might influence others to adopt new products, as early adopters have a need to justify their behavior to others (Arruda-Filho & Lennon, 2011). Furthermore, as gadget lovers play with new technological devices, they learn more about them and discuss the key attributes of gadgets with others, thus increasing the adoption of new high-tech products in the market place.

Usage of leading edge technological goods also keeps gadget lovers thinking of exciting improvements for the newest technologies, and it also enhances their readiness to be the first to adopt or early adopters of new technology based goods (Bruner & Kumar, 2007). More specifically, we believe that the intrinsic motivation of gadget lovers influences people with personal innovativeness to become early adopters of technological goods and services. Thus, we hypothesize:

H5. *Gadget lovers mediate the relationship between personal innovativeness and technological innovativeness.*

The literature also showcases gadget lovers as more knowledgeable about technology; as a result, their opinions are likely sought by those who know them. These people may be perceived as credible because they not only enjoy playing with leading edge technological goods/services but also adopt these technologies as they are driven by high intrinsic motivation. A study conducted by Bruner and Kumar (2007) postulates a positive correlation between gadget lover and technological opinion leadership. Consistent with the previous study, other studies (e.g., Shoham & Ruvio, 2008) indicate some consumers not only seek new gadgets and enjoy finding new uses for them but also become heavily involved in using and learning how to operate novel technological devices. Such learning about gadgets could lead to a higher probability of gadget lovers becoming experts on gadgets, which would enhance their self-efficacy and the probability they would become technological opinion leaders. Based on the above statement, we hypothesize the following:

H6. *Gadget lovers is positively related to technological opinion leadership.*

3. A framework of technological opinion leadership

Based on the literature and hypotheses, a research model has been created (see Fig. 1). In this study, personal innovativeness (PI) is said to have a direct and positive effect on technological innovativeness (TI), which in turn has a direct and positive effect on technological opinion leadership (TOL). Both TI and TOL are also influenced by gadget lovers (GL). See Fig. 2

4. Methodology

4.1. Study 1: student survey

4.1.1. Procedure and participants

To establish face validity, ensure reliability of the measures, and determine a logical arrangement of the questions, the questionnaire is pre-tested using 30 respondents similar in nature to the final sample. Final study data are collected in two phases. In phase one, data are collected from a student population; and, in phase two, for comparison of the student results to the general population, data are collected using a nationwide online survey.

A student population makes ideal participants for the phase one study because: (1) they are presumed comfortable using technology, (2) they are heavy users of high-technology products, and (3) they use technology (e.g., gadgets) as their primary source of communication, information gathering, and social interaction (Gallagher, Parsons, & Foster, 2001).

4.1.2. The survey

An online survey is administered to 1012 college students in phase one. A total of 319 individuals participate in the survey, yielding a

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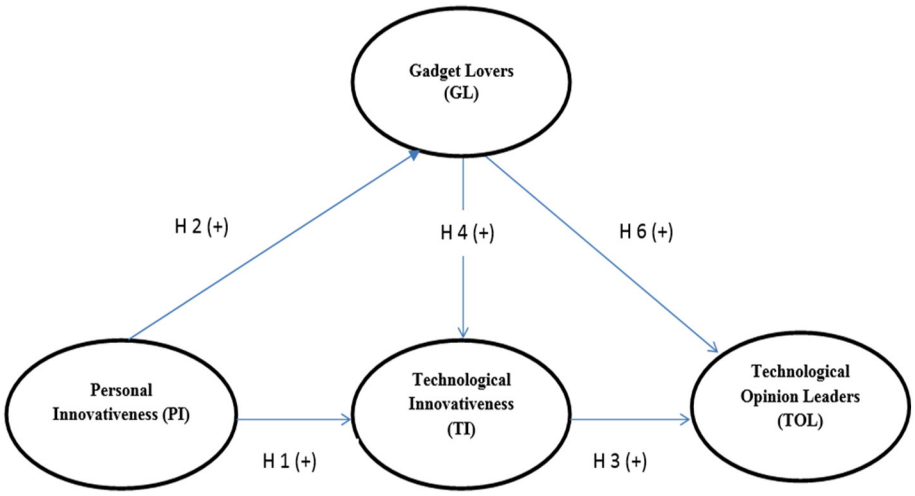

Fig. 1. Theoretical model.

response rate of 31.5%. Of those responses, 292 responses are complete. The remaining 27 responses are eliminated due to incomplete data. The subjects for the phase one study consist of more females than males (58.5% versus 41.5%) ranging in age from 18 to 29 years; the mean is 23.5 years. The majority of the students are white (84.7%); African Americans compose 12.7% of the sample; and Hispanics, Asians, and others compose 2.6%. To improve the generalizability of the findings from the phase one study to the population, a nationwide online survey is administered in phase two.

4.1.3. Measures

Altogether, nineteen items are used to measure the four underlying constructs. All items used to measure the four constructs — personal innovativeness (PI), technological innovativeness (TI), gadget lover (GL), and technological opinion leadership (TOL) — are based on the literature. The constructs PI, TI, GL, and TOL are measured using three, six, seven, and three items respectively. The items measuring the above constructs are shown in the Appendix.

4.2. Structural equation modeling results

In this study, we conduct confirmatory factor to assess the reliability and construct validity, including both convergent and discriminant validity, and a two-step process of structural equation modeling (SEM) is used to test the proposed model. First, we report how the measurement model is estimated and how the structural model is tested (Anderson & Gerbing, 1982).

4.2.1. Measurement model results

All nineteen items are allowed to load against the four proposed constructs. The SEM results indicate the normalized estimate of multivariate kurtosis for the student sample is 30.72, greater than the recommended value of 3. Given this outcome, the robust maximum likelihood estimation method could be used (Bentler, 1990). This method provides more accurate and reliable information than the maximum likelihood (ML) method in such cases of multivariate non-normality (Schumacker & Lomax, 2004). After the measurement model is

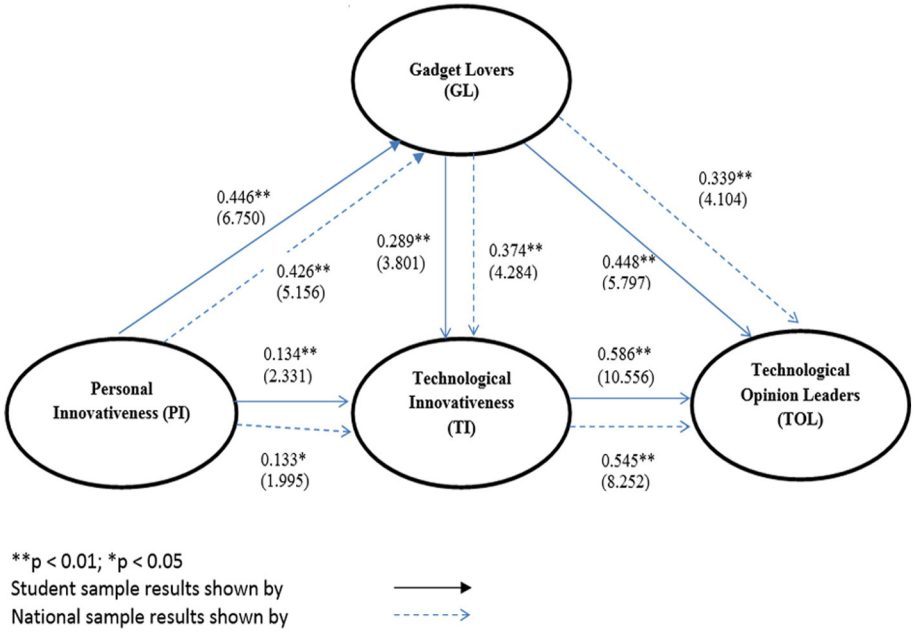

Fig. 2. Structural model result.

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established, each construct is assessed for unidimensionality, construct reliability, convergent, and discriminant validity.

4.2.2. Unidimensionality

A construct is unidimensional if the items measuring the underlying constructs are 0.50 or above (Bollen, 1990). In the model used for this study, all items measuring the underlying constructs range from 0.65 to 0.91, thus meeting the unidimensionality threshold.

4.2.3. Composite/construct reliability

Once unidimensionality is confirmed, composite reliability and average variance extracted (AVE) are also calculated. According to Hair, Black, Babin, and Anderson (2007), composite reliability and AVE represent more reliable measures of underlying constructs and, in turn, provide researchers with greater confidence individual indicators are consistent in their measurement. Composite reliability ranges from 0.83 to 0.94. Table 1 summarizes the measurement model results for each construct.

4.2.4. Convergent and discriminant validity

Next, the four constructs are also tested for convergent and discriminant validity. Convergent validity ensures concepts that *should* be related theoretically *are* interrelated in reality, while discriminant validity conveys the degree to which concepts that should *not* be related theoretically are, in fact, *not* interrelated in reality (Campbell & Fiske, 1959). Convergent validity is supported if the loadings exceed 0.70 and average variance extracted (AVE) estimates for each underlying construct exceeds 0.50 (Chin, 1998; Bentler, 1990; Hair et al., 2007). Discriminant validity is shown when the shared variance between any two constructs is less than the square root of the AVE by the items measuring the construct (Fornell & Larcker, 1981) (please refer to Tables 1 and 2).

4.2.5. Testing the structural model

The structural model (Fig. 2), based on the four constructs and the nineteen items that measured them, is tested for significance. Results of the structural model indicate the fit indices for the structural model provide a close fit to the model with the data showcasing a confirmatory fit index (CFI) of 0.95, non-normed fit index (NNFI) of 0.94, normed fit index (NFI) of 0.92, an incremental fit index (IFI) of 0.95, and a root mean square error of approximation (RMSEA) of 0.078. All model fit indices are in the acceptable range for the calibration sample, thus indicating a good model fit (Hair et al., 2007) (refer to Table 5). The

Table 1
The measurement model result.

Constructs and indicators	Student sample (n = 292)			National sample (n = 215)		
	Standardized loadings[a]	Construct/Composite reliability	Average variance explained (AVE)	Standardized loadings[a]	Construct /Composite reliability	Average variance explained (AVE)
Personal innovativeness (PI)		0.914	0.780		0.902	0.753
• PI 1	0.909			0.880		
• PI 2	0.858			0.854		
• PI 3	0.875			0.878		
Technological innovativeness (TI)		0.932	0.695		0.930	0.702
• TI 1	0.872			0.879		
• TI 2	0.857			0.867		
• TI 3	0.892			0.895		
• TI 4	0.875			0.876		
• TI 5	0.734			0.735		
• TI 6	0.761			0.741		
Gadget lovers (GL)		0.937	0.645		0.929	0.557
• GL 1	0.647			0.646		
• GL 2	0.828			0.831		
• GL 3	0.883			0.887		
• GL 4	0.824			0.839		
• GL 5	0.813			0.815		
• GL 6	0.822			0.812		
• GL 7	0.806			0.799		
Technological opinion leader (TOL)		0.831	0.620		0.849	0.653
• TOL 1	0.705			0.719		
• TOL 2	0.803			0.823		
• TOL 3	0.849			0.883		

Composite reliability = $(\sum \text{Std Loading})^2/(\sum \text{Std Loading})^2 + \sum(\text{Std Error})$.
$\sum(\text{Std Error}) = \sum(1 - \text{Std Loading}^2)$.
Average variance extracted = $\sum(\text{Std Loading}^2)/\sum(\text{Std Loading}^2) + \sum(\text{Std Error})$.
[a] All factor loadings are significant at $p = 0.05$.

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Table 2
Descriptive statistics and correlation of constructs.

	Student sample				National sample			
Constructs	PI	TI	GL	TOL	PI	TI	GL	TOL
Personal innovativeness (PI)	**0.883**	0.389[a]	0.497[a]	0.391[a]	**0.868**	0.356[a]	0.455[a]	0.327[a]
Technological innovativeness (TI)		**0.834**	0.525[a]	0.573[a]		**0.838**	0.526[a]	0.553[a]
Gadget lovers (GL)			**0.806**	0.601[a]			**0.746**	0.545[a]
Technological opinion leader (TOL)				**0.787**				**0.808**
Mean	5.12	2.72	4.43	3.92	5.04	2.69	4.39	3.85
Standard deviation	1.66	1.59	1.66	1.73	1.63	1.62	1.67	1.73

Diagonal elements represent the square root of the average variance extracted (AVE) between the constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.
[a] Correlation is significant at the 0.01 level (2 tailed).

standardized path coefficient for the structural model (refer to Table 3) indicates all tested hypothesized paths are significant.

The results of the structural model indicate personal innovativeness is positively related to technological innovativeness (b = 0.13, t = 2.33; p ≤ .01) and gadget lovers (b = 0.45, t = 6.75; p ≤ .01), thus supporting *hypotheses 1 and 2*. The results also suggest technological innovativeness leads to technological opinion leadership (b = 0.59, t = 10.57; p ≤ .01), thereby, *supporting hypothesis 3*. The result indicates gadget lover is positively related to both technological innovativeness (b = 0.29, t = 3.80; p ≤ .01) and technological opinion leadership (b = 0.45, t = 5.80; p ≤ .01), providing *support for hypotheses 4 and 6*.

To test if gadget lover mediates the relationship between personal innovativeness and technological innovativeness, we follow the three step process as recommended by Baron and Kenny (1986) and James and Brett (1984). First, we test the relationship between personal innovativeness (PI) and technological innovativeness (TI), and results indicate a direct positive effect (b = 0.389, significant). Next, we test the relationship between PI and gadget lovers (GL). The relationship is significant and positive with b = 0.497. In the third step, we regress the predictors (PI and GL) on criterion variable (TI). The results indicate the relationship between PI and TI is 0.169 and significant, thus confirming GL *partially mediates* the relationship between PI and TI. In the presence of GL, although the relationship between PI and TI is significant, the strength of the relationship is weaker compared to the direct effect (0.169 vs 0.389), providing *support for hypothesis 5* (please refer to Table 4).

5. Study 2: nationwide survey

For a comparison of the results obtained in phase one to the general population, a nationwide online survey is undertaken. Data are collected using Qualtrics web-based survey software. The survey is administered to 1500 subjects across the United States (US), and we receive 261 responses, yielding a response rate of 17.4%. Only 215 responses are complete responses, and the remaining 46 are incomplete responses. Subjects range in age from 23 to 70 years; the median is 39 years. There are 39.8% males and 61.2% females. The group is 84.3% white, 12.7% African American, and 3% Hispanic, Asian, and others. They are also well educated: 74.3% have at least completed college. All income categories are represented.

In study 2, we first assess the reliability and construct validity, including both convergent and discriminant validity of the four constructs, and structural equation modeling is used for the testing of the structural model results.

The results indicate all nineteen items measuring the four underlying constructs in study 2 range from 0.65 to 0.90, thus showcasing unidimensionality threshold was met. Study 2 results also indicate the composite reliability of all four constructs are above 0.85, thus indicating the individual indicators are consistent in their measurement. Once unidimensionality and composite reliabilities for the four constructs are met, then we also test for the discriminant validity for these constructs. The results indicate the shared variance between any two constructs is less than the square root of the AVE by the items measuring the construct, thereby suggesting discriminant validity is met. Tables 1 and 2 show evidence of unidimensionality, composite reliability, and discriminant validity among constructs.

5.1. Structural model result

Based on four constructs and the nineteen items that measured them the structural model results for study 2 are tested for significance. Results indicate that the fit indices for the model provide a close fit to the model with the data showing a confirmatory fit index (CFI) of 0.952, non-normed fit index (NNFI) of 0.944, an incremental fit index (IFI) of 0.952, and a root mean square error of approximation (RMSEA) of 0.075. The standardized path coefficient for the structural model (refer to Table 3) indicates all four paths that were tested for significance are strongly significant.

The path coefficients and t-values for the nationwide sample indicate personal innovativeness is a predictor of technological innovativeness (b = 0.133; t = 1.995; p ≤ .05) and gadget lovers (b = 0.426; t = 5.156; p ≤ .01); and technological innovativeness is a predictor of technological opinion leadership (b = 0.545; t = 8.252; p ≤ .01). The results also indicate that gadget lovers is a significant predictor of both technological innovativeness (b = 0.374; t = 4.284; p ≤ .01) and technological opinion leadership (b = 0.339; t = 4.104; p ≤ .01) in the positive direction.

In study 2, we also test if gadget lover (GL) mediates the relationship between personal innovativeness (PI) and technological innovativeness (TI). To test the mediation, we follow Baron and Kenny (1986) three step process. The results indicate when we regress the predictors (PI and GL) on criterion variable (TI), the relationship between PI and TI is 0.147 and significant. However, in the presence of the GL, the

Table 3
Result of the structural model.

Path	Hypotheses	Student sample (n = 292)			National sample (n = 215)		
		Standardized parameter estimate	Critical t-value	Outcome	Standardized parameter estimate	Critical t-value	Outcome
PI -> TI	H1: +	0.134	2.331	Supported	0.133	1.995	Supported
PI -> GL	H2: +	0.446	6.750	Supported	0.426	5.156	Supported
TI -> TOL	H3: +	0.586	10.556	Supported	0.545	8.252	Supported
GL -> TI	H4: +	0.289	3.801	Supported	0.374	4.284	Supported
GL -> TOL	H6: +	0.448	5.797	Supported	0.339	4.104	Supported

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Table 4
Result for mediation (for testing of hypothesis 5).

	Student sample (n = 292)				National sample (n = 215)			
	R	R^2	R^2 change	Beta	R	R^2	R^2 change	Beta
Analysis one: TI on PI	0.389	0.151**		0.389**	0.356	0.127**		0.356**
Analysis two: GL on PI	0.497	0.247**		0.497**	0.455	0.207**		0.455**
Analysis three:								
Step 1: TI on GL	0.525	0.276**		0.441**	0.526	0.277**		0.459**
Step 2: TI on PI	0.545	0.297**	0.021	0.169**	0.542	0.294**	0.017	0.147*

* = $p < 0.05$.
** = $p < 0.01$.

relationship strength between PI and TI weakens compared to the direct effect (b = 0.146 vs b = 0.356), thus confirming GL *partially mediates* the relationship between PI and TI (refer to Table 4).

In summary, the overall results of the structural model for the national sample are similar to that of the student sample, thus ensuring the generalizability of the results to the general population. The results of the structural model for study 2 also suggest all model fit indices are in the acceptable range; all five paths tested for significance are strongly significant; and GL partially mediates the relationship between PI and TI.

6. Discussion of the findings

The objective of the paper is to investigate the factors that drive customers to become technological opinion leaders. We address this issue by investigating the following research questions:

6.1. Does personal innovativeness lead to technological innovativeness and love for gadgets?

The results of the structural model reveal personal innovativeness is positively related to technological innovativeness and gadget lovers in both student and national samples and is a strong predictor of gadget lovers. This outcome may be attributable to the personality traits of these individuals. These innovative individuals may be willing to take chances and to try out various, new technological goods and services because they are curious, venturesome, and stimulation-seeking, and they are able to cope with a high level of uncertainty. Because individuals with personal innovativeness are receptive of risks and novelties, these individuals are fascinated by the novel characteristics of high-tech products. As a result, they want to play with high-tech products to explore their functionalities, which brings them a great amount of enjoyment and excitement.

Table 5
Model fit indices — the structural model.

Fit indices	Acceptable fit threshold	Fit indices for student and national studies	
		Student sample (n = 292)	National sample (n = 215)
S-B χ^2		398.539	317.499
df		147	147
Probability value		0.000	0.000
RMSEA	≤0.08	0.078	0.075
CFI	>0.90	0.949	0.952
NNFI	>0.90	0.941	0.944
IFI	>0.90	0.950	0.952
NFI	>0.90	0.923	0.914

Hair et al. (2007) suggested a value of RMSEA ranging from 0.05 to 0.08 is deemed acceptable whereas a value of RMSEA ≤ .05 indicates a close fit of the model.

Personal innovativeness, which is characterized by a risk taking propensity and ability to cope with uncertainty, is more salient in gadget lovers who are knowledgeable about novel high-tech products in the market place. Their ability to cope with uncertainty allows them to generate an intrinsic motivation to use a variety of leading edge technological goods. However, some gadget lovers who lack knowledge about certain gadgets may have less propensity to play with leading edge technological goods/high-tech products and to take risks on these goods and products. Given the amount of knowledge or previous experience with certain gadgets or producers of the gadgets, gadget lovers might decide not to adopt new products. This suggests the level of knowledge might moderate the relationship between personal innovativeness and gadget lovers or even change the relationship to a U-shaped relationship.

The findings in both studies showcase personal innovativeness as positively related to technological innovativeness. This finding could be due to the fact an individual's receptivity toward trying new things and openness-to-take-chances influence their desire for innovativeness (in this case, it is their desire for innovativeness toward technological goods). This result is consistent with Hartman and Samra's (2008) study, where personal innovativeness, or general innovativeness, impacts actualized innovativeness for most products.

6.2. Does gadget lovers influence technological innovativeness and technological opinion leadership?

The results display gadget lovers as a strong predictor of technological innovativeness (b = 0.289; student sample and b = 0.374; national sample). The rationale for this result could be consumers who love gadgets are fascinated by new and attractive attributes of high technology products. The novel characteristics of gadgets excite and stimulate these consumers; and they become more involved in play and ultimately first adopters. As they explore new gadgets, they constantly think of improvements for the new technology.

This study also finds a strong positive relationship between gadget lovers and technological opinion leadership. This may be due to the fact gadget lovers are more knowledgeable about the technology; therefore, they are perceived as more credible, and their opinions are likely sought by those who know them. Because gadget lovers tend to be technically competent in using new high-tech products and feel comfortable in disseminating information about technological goods/services, they influence others' opinions and their purchasing behaviors. The relationship between gadget lovers and technological opinion leadership is found to be 0.448 and 0.339 in student and national samples, respectively.

6.3. Does technological innovativeness lead to technological opinion leadership?

The findings from both studies show an individual's technological innovativeness is positively related to technological opinion leadership. The

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relationship between technological innovativeness and technological opinion leadership is positive and strong, 0.586 and 0.545 in student and national samples, respectively. Considerable evidence shows individuals who are first to adopt a new high-tech product, before most other people know it exists, want to disseminate information about these products to other consumers and want to influence their purchase decisions. These individuals believe disseminating information about high-tech goods/services to other consumers would not only influence the purchase decisions of other consumers but also improve their own self-image, and they would subsequently receive recognition as an expert in that area of technological goods/services.

6.4. Does gadget lovers mediate the relationship between personal innovativeness and technological innovativeness?

The findings in both studies confirm the gadget lovers construct partially mediates the relationship between personal innovativeness and technological innovativeness. This outcome could be attributable to the fact being a true gadget lover is a personality trait like characteristic (Bruner & Kumar, 2007). These people are willing to take chances and to try new technological goods because of their benefits, features, and functions. Usage of these leading edge technological goods fascinates them, brings them enjoyment, enables them to engage in play with these products, challenges them to learn how to operate them, and keeps them constantly thinking of exciting improvements for the newest technologies. Because gadget lovers are involved in play with high-tech products and are always thinking of avenues for improvement, they should have a strong impact on innovativeness. The novel characteristics in high-tech products not only excite these lovers of technology but also motivate them to be the first to adopt/own a new-technological product in comparison to other people.

7. Implications

7.1. For managers

Our findings are based on two studies that utilize student and general population samples. This approach improves the generalizability of the findings for practicing managers. We examine the key variables that influence technological opinion leadership. The results suggest gadget lovers and technologically innovative consumers explain 43.5% and 39.3% of the variance for the technological opinion leadership in student and national samples.

Furthermore, we find the relationship between personal innovativeness and technological innovativeness is weaker in the presence of gadget lovers, thus indicating the mediational role of gadget lovers. Given these findings, managers need to be aware of the important role gadget lovers may play in the launching and adoption of new products. For example, managers might want to identify individuals who are passionate about owning and using high-tech products before including these individuals in the launching or even the development stages of new gadgets.

Given that technological opinion leaders have a strong influence on other consumers' attitudes and behaviors regarding technological products, managers might be able to increase the dissemination of information about their products to the mass market by giving free products to these leaders because their opinions are considered credible. This decision will further enhance their willingness to try new gadgets.

Managers also need to be aware technological opinion leaders not only spend time learning how gadgets work but also spend time discovering the limitations of the gadgets. Hence, managers might have to mitigate this risk, which counters the positive effect of opinion leadership.

7.2. For scholars

The study improves our understanding of technological opinion leadership. Based on the literature, we develop and test a model of TOL. We contribute by integrating and testing predictors of TOL that exist in the literature. Overall, our model predicts 43.5% and 39.3% of the variance explained in student and national samples, respectively, and improves our overall understanding of TOL.

Specifically, we extend previous research by empirically testing the relationships between gadget lovers, technological innovativeness, and TOL. Bruner and Kumar (2007) find a strong positive correlation between gadget lovers and TOL. In this study, we find technological innovativeness and gadget lovers are important predictors of TOL as technological innovativeness and gadget lovers together explain 43.5% and 39.3% of the variance of TOL, whereas technological innovativeness by itself explains 34.3% and 29.7% of the variance of TOL in the two samples. We also extend the literature by examining the relationships between personal innovativeness, technological innovativeness, and gadget lovers. We find personal innovativeness is a very important predictor of both gadget lovers and technological innovativeness. Furthermore, we also find gadget lovers mediate the relationship between personal innovativeness and technological innovativeness.

Our improved understanding of TOL is a result of two rigorous studies of two different samples. This enhances the rigor of the new insight's contribution and the generalizability of the study. However, we are also aware of the boundaries of our findings and insights. For example, there are situations where the relationships and conclusions from this study may not be applied or even strengthened. The empirical data are collected from the US where people have the tendency to volunteer and are expressive and willing to share information. This occurrence poses the following question: Will the conclusion of this study apply in different countries where people are less expressive?

Similarly, personality dimensions such as extroversion might also be a moderating factor. People who are more extroverted might show stronger relationships between the predictors and TOL. We can also argue gadget lovers might be more attracted to becoming opinion leaders for access to more popular gadgets.

8. Limitations and future research

As with any research, this study is not free of limitations, some of which open avenues for further research. First, this study develops a basic model of predictors of technology opinion leadership to test on student and nationwide samples in the US. Beyond those identified in this study, there are undoubtedly other undetermined factors that may motivate individuals to become involved in technological opinion leadership.

Second, one might also investigate the influence of group factors (such as group affinity, affiliations, or aspirational groups) on an individual's motivation toward technological innovativeness and technological opinion leadership. Third, personality traits of technological innovators that may predict technological opinion leadership is worthy of being examined.

Fourth, data are collected only from US consumers due to limited resources. Therefore, the results of this study can be generalized only over population groups within the US. Hence, a future study of this kind in different countries and cultures would verify if the final model of this study holds true. For example, do the innovative behaviors of consumers from western countries (e.g., US, European countries, etc.) differ from eastern countries (e.g., Asian countries, etc.)? Fifth, another worthwhile research avenue would be to explore the difference between high involved gadget lovers vs. low involved gadget lovers and their influence on technological innovativeness and technological opinion leadership.

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Appendix A. Appendix

Constructs	Definitions	Items	References
Personal innovativeness (PI)	Personal innovativeness is defined as a risk taking propensity that exhibits in certain individuals and not in others. These individuals are willing to take chances and to try new things and are able to cope with high levels of uncertainty.	1. I like to take chances 2. I like to experiment with new ways of doing things 3. New products are usually gimmicks. (Seven point Likert scale 1 = strongly disagree and 7 = strongly agree)	Leonard-Barton and Deschamps (1988)
Technological innovativeness (TI)	Technological innovativeness is defined as the extent to which a consumer is motivated to be the first to adopt new technology-based goods and services.	1. I get a kick out of buying new high tech items before most other people know they exist. 2. It is cool to be the first to own high tech products. 3. I get a thrill out of being the first to purchase a high technology item. 4. Being the first to buy new technology devices is very important to me. 5. I want to own the newest technological products. 6. When I see a new technology in the store, I often buy it because it is new. (Seven point Likert scale 1 = strongly disagree and 7 = strongly agree)	Bruner and Kumar (2007)
Gadget lovers (GL)	Gadget lovers are consumers with high intrinsic motivation to adopt and use a variety of leading-edge technology-based goods, as well as the services that complement them.	1. Old or new, playing with technological products brings me a lot of enjoyment. 2. Some people find it irritating, but I enjoy figuring out how to get technological goods and services to work. 3. Even if they aren't the newest things on the market, learning how to operate technological products is interesting to me. 4. Despite their age, I love to play around with technological gadgets. 5. If I was alone for several hours, I could entertain myself easily if I had lots of gadgets to play with. 6. It is easy for me to spend a lot of time playing around with almost any kind of technological devices. 7. Others may not understand it, but it's kind of a thrill to play with products that have high-tech components. (Seven point Likert scale 1 = strongly disagree and 7 = strongly agree)	Bruner and Kumar (2007)
Technological opinion leadership (TOL)	Technological opinion leaders are defined as those consumers who provide information to other consumers and influence their purchase decisions for technological products.	1. Friends and family look to me for help when they are making decisions involving technological devices. 2. I often persuade other people to buy the technological products I like. 3. I often influence people's opinions about technological goods and services. (Seven point Likert scale 1 = strongly disagree and 7 = strongly agree)	Bruner and Kumar (2007)

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