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The motivation structure of electronic word-of-mouth: Effects of personality on the generation of online articulations

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Abstract

Online services and applications extend influencing opportunities to traditional word-of-mouth advertising. Unlike traditional word-of-mouth, the online environment provides certain features, amongst others, anonymity in user-generated content. Further, the personality of online users affects their motivation to actively provide online articulations. This paper focuses on how personality specifically influences active behavior regarding internet use and the related differentiation between offline and online multipliers. The results show that persons with a weak personality are more active as multipliers, due to a lack of social recognition. On the basis of these results, the practical implications, particularly regarding opinion leaders' role in the online environment, are discussed, as well as an incentive structure presented to address and integrate online multipliers.

1. Introduction

Communication between clients can strongly influence products' introduction to the market and, therefore, the economic outcome. Many online services and, accordingly, online applications contribute to the expansion of information exchange and mutual influence (Senecal/Nantel, 2004; Park/Lee/Han, 2007). A mere 10 percent increase in electronic word-of-mouth advertising has, for example, led to hotel bookings increasing 4.4 percent and cinema turnover 6.3 percent (Ye/Law/Gu 2009; Duan/Gu/Whinston 2008). Rieger (2007) assumes that electronic word-of-mouth advertising has an influence quota of 24 percent with regard to highly priced goods. Since product information, which can be accessed regardless of time, is generated in public and stored, online communicators can fulfill the role of multipliers.

A closer examination of those who, through their activities, can influence buying decisions greatly, is desperately required as there is very limited empirical research on online multipliers (Lyons/Henderson, 2005). Specifically, online communication's special characteristics, such as the mostly self-defined degree of anonymity, requires a systematic examination of this group of people. Contrary to offline articulation, online articulation is not determined by the communicator's appearance or his or her socio-demographic characteristics. Furthermore, online articulation offers a possibility of asynchronous communication, which makes the construction of contents predictable and controllable.
The online environment may therefore be especially relevant for people with few contacts and interpersonal skills, who therefore exhibit inhibited interpersonal behavior (Amiel/Sargent 2004). Public online activity may also be associated with the potential to gain recognition. People who are unable to demonstrate their range of expertise offline due to specific personal constrictions, have the possibility to use the internet with its associated services and applications to do so.

The crucial research question is therefore: How can online multipliers be personality specifically described and addressed? This paper will therefore provide a model with which to obtain a specific personal and differentiated view of such multipliers. This model will also provide a foundation to distinguish these multipliers from classical opinion leaders, thus allowing clustering, which makes it possible to identify specific personal differences between generated online contents. This is followed by an analytic regression analysis of an intrinsic lack of social recognition's direct and moderating influences.

The research question also aims at obtaining information to help characterize the online multiplier and distinguish him or her from classical opinion leaders. This is necessary

because, as Zhu and Zhang (2010) confirm, client articulation does have an influencing effect, especially on less known products. These authors identify a positive relation between the number of client opinions and their influencing effect, as well as the highlighted relevance of the contribution's reliability for this influencing effect. However, studies such as this focus on these articulations rather than on the sources from which they stem. This article seeks to close the research gap by identifying the influencing people via their articulation and offering a description of their personality structure. The research results are important for creating incentive structures for participation in the information diffusion process, as well as for active participation in online communities. Communities of practice could, for example, be established in an open source approach setting, or social media components could be integrated into intra-company online communication.

2. Theoretical basis of the research

2.1 Personality factors in active internet use – current state of research

The personality-specific description of online multipliers requires examining individual motivations as the central driving factors of an active online environment presence. Unfortunately, few current studies address these underlying motivations. One study by Hennig-Thurau et al. (2004) analyzed participation in online communities, such as opinion platforms. The authors identified motives such as altruism and social benefit, which include, for example, social integration, which suggests that the members' reciprocal recognition is a possible reason for participation. However, this finding has not been further discussed. This is regrettable with regard to altruism, since its positive social appraisal links it to increasing self-esteem and striving for recognition as motives (Krebs, 1995). The link between a lack of self-esteem and altruistic motives has already been proven (Schütz/Tice, 1997).

Nor do Wasko and Faraj (2005) consider the impact of such links in studying online activity. These authors explore the structures of motives for people's involvement in communities of practice to which they have free access and which therefore resemble discussion forums. At this point, the possibility of gaining a reputation is found to be explicit, as it is identified as the relevant motivation influencing the quality and number of articles written. This finding may be very relevant, but the authors do not identify for which individuals and groups the possibility of reputation is relevant. Owing to a lack of such personality characteristics, there are no identified implications for online multipliers as a group. Even when this statement is extended to include open source software research, there are still gaps in the research. Striving for recognition has been identified as a motive to

increase self-esteem, just as altruism has been found to be an important motive for participation (see, e.g., Hars/Ou, 2002; Hertel et al, 2003; Lakhani/Wolf, 2005) and striving for recognition a reference to personality; nevertheless, there is no separate description of active users as such.

In keeping with this article's goal to fill the research gap, the results of specific internet personality research also need to be considered. These findings are very heterogeneous. Certain publications state that extrovert people use the internet more (Wolfradt/Doll 2001), while others argue that there is no connection between extroversion and the use of the internet (e.g., Tuten/Bosnjak, 2001 and Swickert et al, 2002). Specifically, Shepherd and Edelmann's (2005) research presents a contrary picture. They found that people with social fears, who are therefore shy, prefer the use of the internet to face-to-face communication (see also Ebeling-Witte et al, 2007; Landers and Lounsbury, 2006). This supports the view that inhibited people use the internet more (Ward/Tracey, 2004; Morahan-Martin/Schuhmacher, 2003). The basis for this finding lies in the experienced increased security found in an anonymous environment (Leung, 2001; Peter et al., 2006) in which inhibited people can act more confidently (Sun et al., 2006). Shaw and Grant (2002) support the view that the internet increases self-esteem (see also Kraut et al., 2002).

The high level of aggregation that often occurs in the two streams of research seems to be a problem. This applies to the use of the internet as well as the often used personality variables. Consequently, some studies suggest analyzing different forms of internet use for a better understanding of the motivation structure (Amichai-Hamburger et al.; 2008; Hamburger/Ben-Artzi, 2000). In this respect, discussion forums and opinion platforms seem to be especially suited to support recognition due to their integrated evaluation function (Gangadharbatla, 2007; Tsai, 2007). This suggestion is implemented in the present article. In addition, the samples used in studies focusing on the internet user's personality are usually very small (e.g., Amichai-Hamburger et al., 2008 with 139 participants and Shaw/Gant, 2002 with 40). This is a problem besides the consideration of personality aspects, as research on communities and their members is also often qualitative.

2.2 Model of intra and interpersonal influence on communication behavior

Through active usage behavior, communication forms can have an influence on buying decisions; therefore, it should be considered that their senders could become online multipliers. Progress reports are an example of such a communication form (see, e.g., Chevalier/Mayzlin 2006). Particularly first progress reports have an influencing effect and

specifically increase their recipients' attention, which could increase the sender's reputation potential (Dellarocas et al. 2007). In addition, suggestions for improvement have to be included in the research design to integrate forward-looking customers like lead users. It is argued that such articulations are part of lead user characteristics and stem from unsatisfied future-orientated needs (Urban/von Hippel 1988). The recipient of such articulations can be the producer of a product, but may also be an online community.

Communication via discussion forums or question-and-answer portals should be further differentiated. The answering of questions has a higher reputation potential than the creation of questions. Consequently, this helps to make the link to altruism explicit, which can be regarded as a motive associated with striving for recognition (see part 2.1). Usage behavior is divided into product-specific elements in the following categories:

Questioning/responding	**Progress Reports**	**Suggestions for improvement**
Asking questions in the online environment	Presenting product ratings/progress reports	Offering suggestions for improvement in a community
Responding to questions in the online environment	Presenting a first product rating or a first progress report	Offering suggestions for improvement outside a community (to a producer/trader etc.)

If one has to control for a lack of recognition's influence, the motivation resulting from this has to relate to the described variables. The ability to make social contact is very important in this regard. Reduced self-esteem and, consequently, an intrinsic striving for social recognition lead to timidity and insecurity due to reduced social competences (Simons/Paternite/Shore, 2001; Dekovic/Meeus, 1997). The reason for an intrinsic lack of recognition is low social competence, which is reflected in low contacting skills and, therefore, increased social isolation. The focus on an intrinsic lack of social recognition includes intra as well as interpersonal activities, which are determined by personality characteristics such as the ability to make contact. Recognition can be monetized through, for example, a well-paid job. In this case, the desire for recognition is not linked to a person but is extrinsic in nature. The conclusion is that even people with a high self-esteem can harbor a high (and, thus, extrinsic)

striving for recognition (Lobel, Treiber, 1992). With the help of the considered personality variables, it is possible to differentiate between intrinsic and extrinsic striving for recognition.

To differentiate between online multipliers and traditional opinion leaders requires considering several influencing factors. This concerns the product-specific competence, which includes subjective as well as objective knowledge. Traditional opinion leaders' identified increased social competence (Weimann 1994; Piirto 1992). Their greater social competence and product knowledge allows them self-efficacy and consequently instills a relatively high level of self-esteem (Summers 1970) and an increased degree of assertiveness and self-security. As part of the opinion leader concept, the personality strength construct is based on a leader's stable personality characteristics (Weimann et al. 2007) and is, consequently, another explanation variable. The link between product-specific knowledge and personality strength should identify a classical opinion leader and be able to control whether his function as a multiplier can be extended to an online environment.

Apart from the user-specific view, the media-specific view also needs to be included. As described in section 2.1, it is assumed that the possibility of an introvert person gaining a reputation or achieving the status as an expert may be linked to his or her online activity. Achieving such a status requires a degree of self-determined anonymity and an asynchronous interaction. Discussions and opinion portal forums can provide these requirements. Integrated functions, such as collaborative rating systems, allows the recipient to appraise the provider's competence and the editor has a source from which to determined his or her reputation (Tsai, 2007). This application seems to meet the provider's striving for recognition by increasing his or her self-acceptance (Gangadharbatla, 2007; Mc Kenna/ Bargh, 1998).

The link between the user-orientated view and the media-specific form of use is captured in the framework of this research (see figure 1):

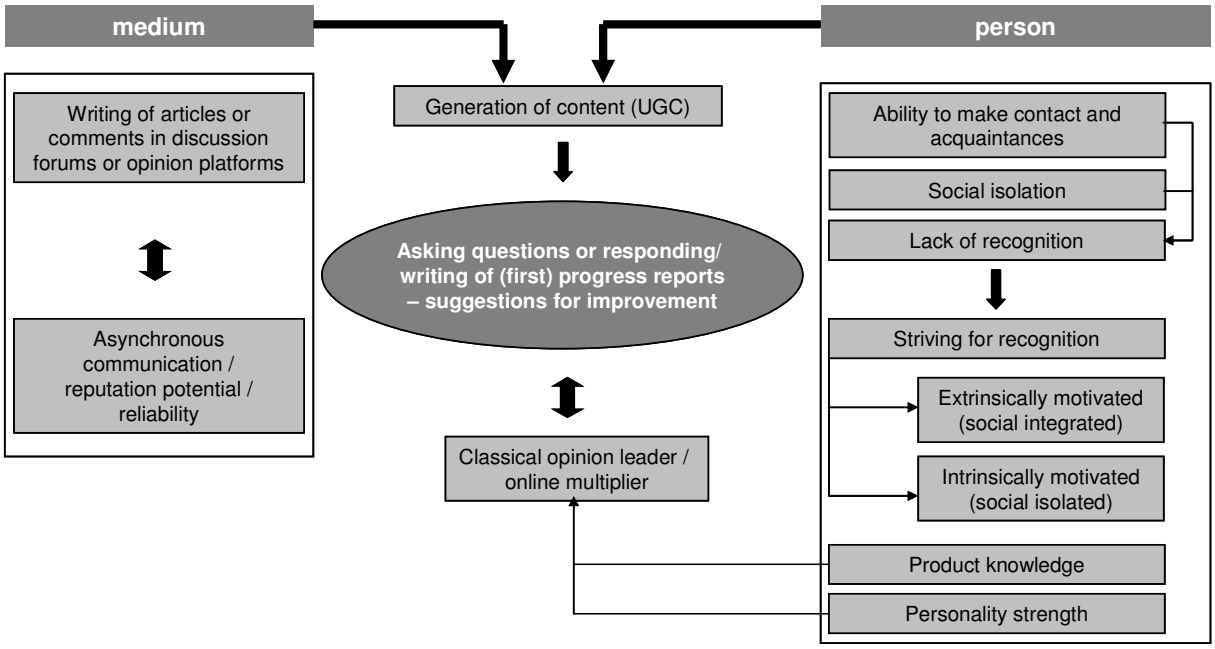

Figure 1: Framework of the research

The framework presented for this research requires some explanation. On the one hand, it is assumed that a lack of recognition directly influences the activity of acquiring a reputation through the online environment's presented possibilities. This assumption is also specifically made due to social recognition's relevance for our mental and physical well-being. On the other hand, the moderating effect of this lack of recognition on reputation seeking behavior has to be proved. Owing to online providers' general anonymity, recognition can only be gained if competences are exhibited by means of own efforts, experiences, and skills. These mentioned factors are based on subjectively felt knowledge of and experiences with a product. Since it is assumed that there are moderated effects, the recommendation to integrate personality variables with online user behavior analyses should be followed (Swickert et al. 2002; Shaw/Gant 2002).

If product experiences or product knowledge is available and an improvement in reputation is possible, a lack of social recognition could play a role in the relationships between experiences/knowledge and active online user behavior. Specific (innovative) buying behavior is relevant for gaining product experiences. This also applies to the communication of suggestions for improvement. In this respect, a likely assumption is that of the lead user characteristic, which focuses on capital goods but allows the transfer to consumer goods (Urban/von Hippel 1988). The explanation of the framework, including the postulated connections, builds the following (product-specific) research model (see figure 2):

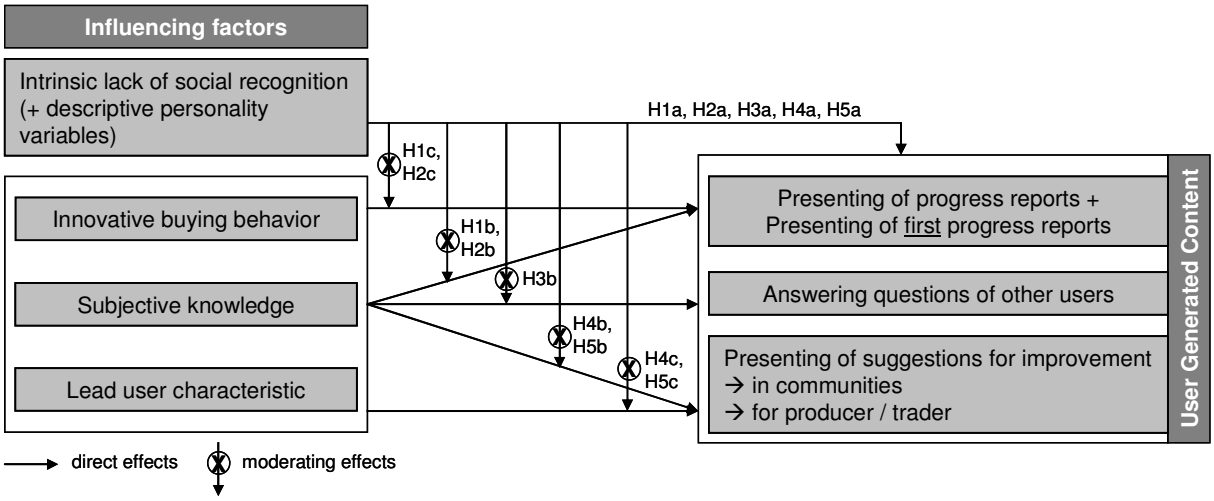

Figure 2: Research model and hypotheses on product-specific online user behavior

Therefore, the hypotheses are characterized by direct and moderated effects postulating that the specific relationships are similar to ordinal interactions. No hypotheses have been formulated regarding the area of asking online questions because this is an explorative approach, while the asking of questions is not linked to gaining a reputation and no theoretical reference have, therefore, been provided. The following hypotheses have been formulated on product-specific online user behavior:

H1a: The greater the intrinsic lack of social acknowledgment, the more intense the online communication of first progress reports.

H1b: The link between subjective knowledge and the online communication of the first progress reports is weak if there is a weak rather than a strong lack of social recognition.

H1c: The link between innovative buying behavior and the online communication of the first progress reports is weak if there is a weak rather than a strong lack of social recognition.

H2a: The greater the intrinsic lack of social recognition, the more intense the online communication of progress reports.

H2b: The link between subjective knowledge and the online communication of progress reports is weak if there is a weak rather than a strong lack of social recognition.

H2c: The link between innovative buying behavior and the online communication of progress reports is weak if there is a weak rather than a strong lack of social recognition.

H3a: The greater the intrinsic lack of social recognition, the more intense the answering of other online users' questions.

H3b: The link between subjective knowledge and the answering of other online users' questions is weak if there is a weak rather than a strong lack of social recognition.

H4a: The greater the intrinsic lack of social recognition, the more intense the communication of suggestions for improvement in communities.

H4b: The link between subjective knowledge and the online communication of suggestions for improvement in communities is weak if there is a weak rather than a strong lack of social recognition.

H4c: The link between lead user characteristics and the online communication of suggestions for improvement in communities is weak if there is a weak rather than a strong lack of social recognition.

H5a: The greater the intrinsic lack of social recognition, the more intense the communication of suggestions for improvement by contacting the producer or the specific retailer.

H5b: The link between subjective knowledge and the communication of suggestions for improvement by contacting the producer or the specific retailer is weak if there is a weak rather than a strong lack of social recognition.

H5c: The link between the lead user characteristics and the communication of suggestions for improvement by contacting the producer or the specific retailer is weak if there is a weak lack rather than a strong lack of social recognition.

3. The empirical study

3.1 Research object and sample

To realize a great deal of practical value from the results, the research object has been chosen from a very dynamic industry sector, the electronic consumer goods sector, due to the importance of its swiftly increasing diffusion rate. Furthermore, the product area should have an online affinity, which means it has to be the object of online articulation, as this is very important for the verification of the hypotheses. Portable digital audio players, also called MP3-players, meet all of these criteria.

The internet users were researched by means of a standardized online questionnaire. The population comprised students from different universities – which is suitable for the analyzed issue. Students use the internet extensively and anticipate the direction in which the whole population will be moving (Lyons/Henderson 2005). Students are also often chosen as the subjects of other empirical studies, which facilitates comparability with this paper and other future studies.

Initially, a pretest was undertaken with 37 students to identify possible errors and improve the questionnaire's ability to gather the type of data suitable for the stated purpose. Small changes were subsequently incorporated. The definite online survey took place between August 31,

2008 and January 11, 2009. Table 1 presents an overview of the questionnaire completed in full by 16,907 students.

	Activated link of the survey → gross participation	First site of the question-naire → net partici-pation	Completed question-naires	Rate of completed question-naires to gross participation	Rate of completed question-naires to net participation	Average time required to fill out the question-naire
Universities/ colleges of higher education	28,866	26,246	16,907	58.57%	64.42%	18:74 min

Table 1: Rates of participation and size of the sample

3.2 Operationalization and validation of the constructs

The operationalization of the latent constructs was undertaken with multi-item scales (Bagozzi/Baumgartner 1994). Proven and tested psychology methods, as well as standardized item pools were mainly used as the personality scales.

The operationalization is subsequently described and presented in table 2. Negatively formulated items are indicated with an "r" and have been recoded for interpretation. The validation of the constructs was achieved with first generation methods (Cronbach Alpha and explorative factor analysis), but also with second generation confirmative factor analysis.

The measuring of product knowledge as a part of consumer knowledge requires objective knowledge to be differentiated from subjectively realized knowledge (Flynn/Goldsmith 1999). Subjective knowledge can be measured with the help of a standardized scale, while objective product knowledge requires a properly designed test. Multiple choice questions were used for this purpose. The questions and the possible answers were developed by studying test reports and producer information, as well as obtained through expert interviews. Objective knowledge is therefore an aggregation of the correctly answered questions, with a weight indicating the degree of difficulty. For further analysis, the weight of the questions, which was indicated by points, was transformed into a rating scale.

The items in table 2 were used for the multi-item measurement. Since no scales are available that differentiate between extrinsic and intrinsic striving for social recognition, no differentiated operationalization could be undertaken. As described in section 2.2, differentiation should be done by means of the two personality variables: social isolation and ability to make contact and acquaintances.

Construct	Content definition	Item	According to:
Subjective knowledge	I know MP3-players very well.	SK1	Brucks (1985); Alba (1983)
	I am always aware of the latest development in the area of MP3-players.	SK2	
	If I hear something new about MP3-players, I am interested to learn more.	SK3	
Lack of social recognition	I sometimes experience that my work is not appreciated although I do my best.	LSR1	Own formulation
	I sometimes try in vain to be recognized for my good performance.	LSR2	
	I think I deserve more respect.	LSR3	
	Sometimes I miss being appreciated and accepted by others.	LSR4	
Social isolation	There are times when I have too little contact with other people.	SI1	Hunt et al. (1981)
	I sometimes feel that I do not have contact with other people.	SI2	
	I sometimes feel isolated from other people.	SI3	
	Sometimes I miss friends with whom I can do something.	SI4	
Ability to make contact and acquaintances	I can easily make contact with other people.	CAA1	Duran (1992); Rubin/Martin (1994); Leary (1983)
	I am a little shy and insecure in contact with other people.	CAA2_r	
	I feel awkward when I meet strangers.	CAA3_r	
Striving for social recognition	I enjoy compliments very much.	SSR1	Herche (1994); Scott (1965)
	It is important for me to be respected.	SSR2	
	Others' appreciation is really important for me.	SSR3	
Personality strength	I like taking responsibility.	PS1	Weimann et al. (2007)
	I like to convince people of my opinion.	PS2	
	I like to lead in joint ventures.	PS3	
	I am good at making myself felt.	PS4	
lead user characteristic	I sometimes have needs that cannot be satisfied by the available portable audio players.	LU1	Franke/Shah (2003); von Hippel (1986)
	In the past I had various problems with portable audio players to which there was as yet no solution (in the form of special products or services).	LU2	
	I am not satisfied with the available product solutions in the area of portable audio players.	LU3	
Innovative buying behavior	It is important for me that I choose a state of the art design model with all technical possibilities when buying a new MP3-player.	IBB1	Goldsmith/Hofacker (1991); Klink/Smith (2001)
	If I buy a new MP3- player now, I will only buy the newest technology.	IBB2	
	When I buy a new MP3-player, a common standard model without technical refinements is good enough.	IBB3_r	
	I would choose the most technically advanced MP3-player if I were to buy one.	IBB4	
Legend of the scales: 1 = I do totally not agree , …, 6 = I totally agree			

Table 2: Operationalization of the personality and product-specific characteristics

The results of the constructs' validation are presented in table 3. The subjective knowledge data, social isolation, contact ability, and innovative buying behavior presented very strong result in the factor analytic test. The test confirmed the validity and reliability of the realized operationalization. There were also no great divergences in the critical value of a lack of social recognition. The explorative factor analysis showed a good result regarding striving for social recognition, although the KMO value just missed the minimum 0.7 value.

The confirmative analysis demonstrated weaknesses, but the factors' reliability satisfied the need for sufficient factor loadings. Since an overall view of the performance criteria is crucial for an evaluation, and, as a global description, the construct is not part of an analysis requiring a high degree of reliability – especially with regard to the moderated regression –, an index could be built despite the demonstrated weaknesses.

Construct	Item	Factor loading (>0,4)	t-value (>1,645)	Item reliability (>0,4)	Factor reliability (>0,6)	Average measured variance (>0,5)	Item to total-correlation (>0,5)
Subjective knowledge	SW1	0.797	105.701	0.635	0.899	0.750	0.711
	SW2	0.911	*	0.830			0.777
	SW3	0.718	96.812	0.516			0.659
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	2.303		76.78 %		0.847	0.705	
Lack of social recognition	MSA1	0.650	72.060	0.423	0.769	0.454	0.568
	MSA2	0.750	*	0.563			0.635
	MSA3	0.697	76.113	0.486			0.590
	MSA4	0.697	76.074	0.486			0.610
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	2.464		61.60 %		0.791	0.777	
Social isolation	SI1	0.645	88.590	0.416	0.894	0.916	0.596
	SI2	0.691	96.399	0.477			0.631
	SI3	0.771	109.635	0.594			0.679
	SI4	0.909	*	0.826			0.781
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	2.706		67.66 %		0.837	0.790	
Ability to make contact and acquaintances	KUV1	0.753	89.227	0.567	0.864	0.680	0.664
	KUV2_r	0.868	*	0.753			0.727
	KUV3_r	0.718	86.838	0.515			0.640
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	2.212		73.726 %		0.822	0.706	
Striving for social recognition	SSA1	0.487	45.380	0.237	0.593	0.334	0.404
	SSA2	0.761	*	0.579			0.547
	SSA3	0.693	47.063	0.480			0.514
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	1.829		60.98 %		0.672	0.637	
Personality strength	PS1	0.613	63.210	0.376	0.633	0.303	0.507
	PS2	0.559	58.847	0.312			0.472
	PS3	0.733	68.820	0.537			0.597
	PS4	0.712	*	0.507			0.592
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	2.283		57.077 %		0.745	0.760	
Lead user characteristic	LU1	0.748	49.403	0.560	0.821	0.610	0.607
	LU2	0.822	*	0.676			0.640
	LU3	0.549	45.325	0.301			0.479
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	1.990		66.320 %		0.746	0.658	
Innovative buying behavior	IKV1	0.870	153.792	0.757	0.932	0.774	0.807
	IKV2	0.908	*	0.824			0.830
	IKV3_r	0.728	114.483	0.530			0.692
	IKV4	0.805	135.148	0.648			0.751
	Eigenvalue		Explained variance		Cronbach Alpha	KMO	
	3.056		76.41 %		0.895	0.832	

Table 3: Validation of the personality constructs and product-independent characteristics

There were a few weaknesses in the indicator reliability and with regard to the average measured variance in the personality strength's operationalization. However, the elimination of corresponding items is not recommended, as this could destroy the scale's content design without improving the quality criteria. In addition, the test for the lead user characteristic showed just a slight divergence with regard to the KMO value, while the confirmative test also showed no sign that could question the scale's validity and reliability. Only the LU3 item did not achieve the indicator reliability level. Owing to the large sample size, it can be assumed that potential efficiency deficits are compensated for, thus resulting in a balance.

Since the ability to make contact and acquaintances and social isolation could contribute to the validation of an intrinsic lack of social recognition, a discriminant validity test had to be undertaken. It was also necessary to prove that the constructs presented in respect of striving for social recognition measure different personality facets. Consequently, a combined factor analysis was undertaken of the four identified individual results after the explorative and confirmative measurements. All the indicators could then be related to their particular constructs due to the sufficient factor loadings.

4. Empirical results

4.1 Cluster analysis and segmentation of the personality

The following analysis was undertaken to differentiate between intrinsically and extrinsically motivated people's striving for recognition. This was the source of the differentiated examination of online and offline multipliers. A three-cluster result, confirmed by the average linkage method, could be identified by means of the Ward's method with an increase in the sum of the errors squared, as well as by means of a graphical dendrogram. The ascertained cluster centers of the personality types are shown in table 4. The quality of the built groups was identified by means of discriminant analysis, which confirmed the usability of the included variables for group building.

Type of personality	Cluster	Ability to make contact and acquaintances [a]	Lack of social recognition[b]	Social isolation[c]	Striving for social recognition[d]
Average characteristic (AV)	1	4.14	2.67	2.74	3.54
Intrinsically motivated (IR)	2	3.39	3.80	4.06	4.67
Extrinsically motivated (ER)	3	5.07	2.40	1.94	4.74

Legend of the scales:
[a]1 = low contact and acquaintance ability, …6 = high contact and acquaintance ability
[b]1 = low lack of social recognition, …6 = high lack of social recognition
[c]1 = low social isolation,… 6 = high social isolation
[d]1 = low striving for social recognition, … 6 = high striving for social recognition
IR= intrinsically motivated striving for social recognition / ER= extrinsically motivated striving for social recognition
AV= average characteristic (no conspicuity relating to striving for recognition)

Table 4: Cluster of the personality segmentation

People lacking social recognition are characterized by a weak ability to make contact and acquaintances, are very isolated socially, and are therefore described as rather introvert. Consequently, a lack of social recognition is intrinsic. The lacking ability to distinguish between intrinsic and extrinsic characteristics, already broached in the operationalization of striving for social recognition, was noticeable. Extrinsically motivated people therefore demonstrate more or less the same value regarding striving for recognition, but a lesser value regarding their intrinsic lack of social recognition. The building of a cluster called “average characteristic” beside the already described extreme forms, was also identified. Consequently, this cluster is inconspicuous with regard to the striving for recognition.

In order to undertake a product-specific analysis, the identified groups had to be enlarged with the knowledge in the product area. The goal was to identify groups in the personality-specific cluster with a high subjective and objective knowledge of digital audio players (MP3-players). For this purpose, the types of personality were each clustered with the two knowledge variables and the results confirmed with discriminant analysis.

In the next analysis only the groups with a high knowledge (objective and subjective) were relevant, as the aim was to distinguish them from opinion leaders. This justified the assumption that classical opinion leaders do indeed have a high product competence as they provide quite independent information. Besides their high product knowledge, as described in section 2.2, a key position in a social network is especially relevant for the identification of classical opinion leaders. This is enhanced by their increased social integration due to their improved assertiveness and self-confidence. Such socially active and influencing people are

measured with the personality strength scale. Therefore, it is assumed that, in personality-specific groups, there are differences in personality strength, which was confirmed. Consequently, the rather extrovert group has the strongest personality strength, while the rather introvert group has the weakest. The identification of the classical opinion leader is therefore focused on the ER group, which only takes people with a high subjective and objective product knowledge into consideration. To create a comparison to classical opinion leaders regarding their personality, the group ER-HK (HK-high product knowledge) is compared with the groups AV-HK and IR-HK.

4.2 Personality-specific online communication behavior

In section 2.2, specific online articulations were presented that could have an influencing effect on the recipient. In table 5, these articulations are presented in the three personality groups. Since there was no homogeneity in the variance, the parameter-free Kruskal-Wallis test was applied.

Characteristic	Average value in groups			Homogeneity in variance		Kruskal-Wallis test	
	AVHK	IRHK	ERHK	F		χ^2	p
Delivery of first progress reports of portable audio players[2]	1.51	2.03	1.40	103.156	0.000	112.723	0.000
Delivery of progress reports of portable audio players [2]	2.54	3.18	2.44	7.321	0.001	110.033	0.000
Answering of questions/ solving problems of portable audio players [1]	2.16	3.06	2.11	199.859	0.000	398.425	0.000
Asking questions about portable audio players [2]	2.93	3.05	3.03	18.064	0.000	3.022	0.221
Provide suggestions for improvements in communities[2]	2.12	2.85	2.09	79.456	0.000	342.837	0.000
Provide producers/traders[2] with suggestions for improvements	2,07	1,73	2,42	68,532	0.000	252.620	0.000

[1]assumption of normal distribution confirmed / [2] assumption of normal distribution breached

Table 5: Product-specific creation of online articulations

It can be seen that people with an intrinsic striving for recognition undertake activities that have a high potential for gaining a reputation more. This affects the writing of (first) progress reports, as well as the answering of questions. The posing of questions cannot be related personality specifically ($p = 0.221$). The high discrepancy between the communication of suggestions for improvement in communities and for producers/traders is conspicuous. Indeed, communication with producers/traders also has a reputation potential, but introverted

people are more active in a community, whereas extrovert people communicate with producers. T-tests of the relevant groups IR-HK and ER-HK reflected a significant level.

This finding shows that there are many important product-related differences. People who could be called online multipliers due to their answering of questions or composing (first) progress reports are not similar to classical opinion leader, whose characteristics fall into the group ER-HK. People with an intrinsic striving for recognition and high product knowledge (IR-HK) write (first) progress reports more often and answer questions more often than people who do not have these personality characteristics. Conversely, the classical opinion leader (ER-HK) has a higher activity level ($p = 0.000$) with regard to suggestions for improvement that are communicated directly to the producer.

4.3 Personality-specific influence on online articulations

Subsequently, the influence of an intrinsic lack of social recognition on product-specific online articulation's strength and direction had to be analyzed by means of regression analysis.

This is a two-stage approach. In the first stage, the personality variables and the moderator, lack of social recognition, were included in the regression model with more independent variables. Owing to the implied quasi moderation, this basic model had to be proved regarding the variables' direct effects. In the following stage, the specific product terms were formed by the predictor variable and the moderator variable and included in the regression equation (Aiken/West 2003; Cohen et al. 2003). The developed interaction model was able to identify the moderator effects (see table 6).

Before the interpretation of the product terms, the personality variables' influence and, therefore, the lack of social recognition dimension had to be proved. Social isolation has a positive relationship with the communication of (first) progress reports and with the answering of questions, while the ability to make contact and acquaintances has a negative relationship. Since a lack of social recognition also has a significant positive relationship, it can be classified as intrinsic and can be further interpreted. The results (basis model) allow the intrinsic lack of social recognition's assumed direct effect to be confirmed. Hypotheses H1a, H2a and H3a are therefore confirmed.

Dependent variable	Delivery of progress reports		Delivery of first progress reports		Answering questions	
Parameter	Basic model	Interaction model	Basic model	Interaction model	Basic model	Interaction model
	B (t-value)	B (t- value)	B (t- value)	B (t- value)	B (t- value)	B (t- value)
constant – a_0	2.653 (18.536)***	2.646 (18.635)***	1.661 (16.906)***	1.648 (17.277)***	2.508 (28.097)***	2.505 (28.373)***
CAA – b_0	-0.158 (-6.659)***	-0.157 (-6.676)***	-0.103 (-6.319)***	-0.101 (-6.389)***	-0.143 (-9.739)***	-0.143 (-9.902)***
SI – b_1	0.152 (6.868)***	0.152 (6.952)***	0.097 (6.382)***	0.097 (6.622)***	0.118 (8.536)***	0.120 (8.748)***
SK – b_2	0.287 (13.036)***	0.276 (12.648)***	0.076 (5.060)***	0.069 (4.719)***	0.299 (20.608)***	0.261 (17.828)***
LSR – b_3	0.133 (5.641)***	0.080 (3.297)**	0.179 (11.065)***	0.145 (8.930)***	0.282 (23.166)***	0.272 (22.559)***
IBB – b_4	0.007 (0.312)	0.009 (0.397)	0.152 (9.985)***	0.155 (10.461)***		
LSR x IBB – b_5		0.004 (0.192)		0.217 (14.983)***		
LSR x SK – b_6		0.168 (8.114)***		0.028 (1.982)*		0.161 (14.106)***
R^2	0.098	0.113	0.128	0.179	0.190	0.207
corr. R^2	0.098	0.111	0.128	0.178	0.189	0.207
F- value	118.911***	98.787***	160.660***	169.493***	526.571***	470.315***
change in R^2	0.046	0.014	0.062	0.050	0.094	0.018
change in F	92.449***	43.808***	128.540***	167.099***	523.468***	198.971***
f^2		0.017		0.062		0.021
power		1.000		1.000		1.000

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 6: Results of the moderated regression analysis of the articulation of (first) progress reports and the answering of questions

Furthermore, it is obvious that the product term b_6 (LSR x SK) is significant with regard to the first and the following progress reports. Conversely, the product term b_5 (LSR x IBB) only has a significant level regarding the first progress reports. This is understandable because innovative buying behavior's direct effect could not be identified regarding the following progress reports. Hypothesis H2c is therefore not confirmed at this stage. The test of the product term b_6 (LSR x SK) regarding the answering of questions also reached a significant level. When product terms were included, this led to a significant increase in the R^2 of 0.050 regarding the first progress reports. With the following progress reports, the increase is 0.014 and therefore clearly smaller. There is an increase of 0.018 regarding the answering of questions. But, as can already be seen in the coefficients of the determination, the effects' strength is small in all the cases (Cohen et al. 2003). These results confirm the existence of moderator effects, whereby the risk of a second-degree error can be omitted with 100 per cent (value 1) certainty.

The identified moderator effects had to be analyzed further. The link between subjective knowledge or innovative buying behavior and the communication of (first) progress reports or the answering of questions had to be proved separately for those with a small intrinsic lack of social recognition and those with a high intrinsic lack. With the formation of clusters in section 4.1, two groups were already identified, one with a weak and one with a strong lack of social recognition. The statistical test of the significance of the increase in the regression line had a significant result in all the cases. The graphical test showed no obvious crossover of the conditional regression lines in the researched range. This leads to the postulated ordinal interaction. The result confirms a lack of social recognition's positive moderator effect. As a conclusion, hypotheses H1b, H1c, H2c, and H3b are confirmed.

The articulation of suggestions for improvement can be made in an online community as well as directly to a producer or trader. Besides subjective knowledge, the influencing variable is the lead user characteristic. The results are presented in table 7.

Dependent variable	Report suggestions for improvement in communities		Report suggestions for improvement to producers/traders	
Parameter	Basic model	Interaction model	Basic model	Interaction model
	B (t-value)	B (t- value)	B (t- value)	B (t- value)
constante – a_0	2.108 (19.238)***	2.074 (19.418)***	1.380 (12.783)***	1.382 (12.798)***
CAA – b_0	-0.078 (-4.278)***	-0.78 (-4.409)***	0.133 (7.429)***	0.133 (7.445)***
SI – b_1	0.086 (5.202)***	0.091 (5.609)***	-0.085 (-5.182)***	-0.085 (-5.201)***
SK – b_2	0.166 (10.794)***	0.171 (11.387)***	0.186 (12.280)***	0.186 (12.247)***
LSR – b_3	0.135 (7.830)***	0.043 (2.326*	-0.090 (-5.257)***	-0.075 (-3.985)***
LU – b_4	0.256 (16.805)***	0.245 (16.499)***	0.305 (20.363)***	0.306 (20.386)***
LSR x LU – b_5		0.243 (16.887)***		-0.026 (-1.807)
LSR x SK – b_6		0.004 (0.271)		-0.009 (-0.610)
R^2	0.141	0.185	0.160	0.161
corr. R^2	0.140	0.184	0.160	0.160
F- value	184.532***	182.429***	214.922***	154.211***
change in R^2	0.096	0.044	0.112	0.001
change in F	210.500***	152.365***	251.176***	2.205
f^2		0.054		0.001
power		1.000		0.417

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

Table 7: Results of the moderated regression analysis of the articulation of suggestions for improvement

As seen in the results of the personality-specific comparison between groups in section 4.2, there is also an explicit difference in a lack of social recognition's direct effect regarding the regression analytic study of suggestions for improvement. There is, therefore, a significant positive effect related to articulation in communities that is supported by the descriptive personality variables' characteristics. However, there is a contrary relationship regarding communication with producers. A lack of social recognition has a significant negative influence, which is also confirmed by the descriptive personality variables. Therefore, hypothesis H4a is confirmed, whereas hypothesis H5a is not.

In respect of the link to lead user characteristic, the product terms' regression coefficient test only had a significant result regarding the communication of suggestions for improvement in communities. Owing to this moderating effect, an extra of 4.4 per cent of the criterion variance is explained. The strength of the effect is again small. The assumption of a positive moderation was tested by analyzing the link between the lead user characteristic and the articulation of suggestions for improvement in communities differentiated into cases with a strong and weak intrinsic lack of social recognition. The positive moderation of a lack of social recognition was observed in the significant increase in the conditional regression lines within an ordinal interaction.

A lack of social recognition showed no proven moderator effect regarding communication with producers or traders. At this juncture, the analysis of power was only 41.7 per cent, which contrasts completely with the 100 per cent concerning articulation in communities and needs to be examined. It should be considered that the existing results indicate a negative moderation. Consequently, just hypothesis H4c is confirmed. No moderating impact could be confirmed on subjective knowledge's relationship with the communication of suggestions for improvement; hypotheses H4b and H5b are therefore not proven. Similarly, no moderation could be identified related to the relationship between the lead user characteristic and articulation with producers/traders, which means hypothesis H5c is not confirmed.

5. Summary and discussion of the results

The empirically verified research hypotheses, educed from theoretical considerations, are outlined in table 8.

Product-specific online articulation with possible multiplier effect and potential for customer integration			
Hypothesis	Statement	Correlation	Outcome
H1a	When writing first progress reports (FFR) on portable audio players, the following relation is true:	LSR ↑ → FFR ↑	confirmed
H1b		LSR ↑ : (SK→ FFR) ↑	confirmed
H1c		LSR ↑ : (IBB → FFR) ↑	confirmed
H2a	When writing progress reports (FR) on portable audio players, the following relation is true:	LSR ↑ → FR ↑	confirmed
H2b		LSR ↑ : (SK→ FR) ↑	confirmed
H2c		LSR ↑ : (IBB → FR) ↑	unconfirmed
H3a	When answering questions (AQ) on portable audio players, the following relation is true:	LSR ↑ → AQ ↑	confirmed
H3b		LSR ↑ : (SK→ AQ) ↑	confirmed
H4a	When communicating suggestions for improvements of portable audio players in communities (SIC), the following relation is true:	LSR ↑ → SIC ↑	confirmed
H4b		LSR ↑ : (SK → SIC) ↑	unconfirmed
H4c		LSR ↑ : (LU → SIC) ↑	confirmed
H5a	When communicating suggestions for improvements of portable audio players to the producer/salesmen (SIP), the following relation is true:	LSR ↑ → SIP ↑	unconfirmed
H5b		LSR ↑ : (SK → SIP) ↑	unconfirmed
H5c		LSR ↑ : (LU → SIP) ↑	unconfirmed
LSR= lack of social recognition / SK= subjective knowledge / IBB= innovative buying behavior / LU= lead user-characteristic			

Table 8: Summary of hypothesis testing

Based on the theoretical gaps, as identified in section 2.1, this paper has enhanced research greatly. By educing the striving for recognition motivation from specific personal characteristics, this research has demonstrated that persons with an intrinsic lack of social recognition increasingly undertake the communication of progress reports and the important articulation of first progress reports for product launches. This also applies to answering questions. The links between personality and motivation, which have been lacking to date, been used to characterize the online multiplier. This approach supports the direct differentiation between the online multiplier and the classical opinion leader, which has not to date been specifically undertaken regarding personality. In the portable digital audio player product range, it could be proved that persons who, due to their writing of (first) progress reports and answering of questions, have a multiplier role are not identical to those who comply with the classical opinion leader concept. These online multipliers can be described as introverted. Furthermore, the personally determined use of the internet has been extended to the writing of suggestions for improvements in communities, so that the identified personality concept relates to the modern customer (lead users). In this case, an intrinsic lack of recognition has a direct but also indirect effect on the articulation of suggestion for improvements by means of the lead-user characteristic. The findings regarding the producers

or traders and, therefore, commercial-oriented online offers were specifically considered. Here, a contrary observation is that extroverted persons, who can be regarded as opinion leaders, are taking an active role in the articulation of suggestion for improvements. Previously research has not mentioned this differentiation.

On the whole, the undertaken research indicated that inhibited people are more active. The level of knowledge in the field has therefore been advanced by verifying the reasons for this empirically based on personality type. This also explains the heterogeneity of the research, presented in section 2.1. Inhibited people's increased activity is restricted to sub areas, which are used to combat a lack of social recognition. This applies, for example, to answering questions in discussion forums. The results of the personality-specific characterization can contribute to identifying online multipliers and to constructing an adequate stimulation through which to address this group.

6. Implications and need for further research

It is particularly possible during a new product launch to reach a critical mass of consumers early with the help of the internet's technical possibilities. This research has demonstrated that online-multipliers cannot be compared to classical opinion leaders. For the online area to be used effectively, a focus is required on this area to identify possible multipliers. Owing to an intrinsic lack of recognition's influence, evaluation systems and ranking forms could be used for identification. This enables the participants to publicly present their engagement and competence. If there is no such evaluation system, the lack of recognition cannot be solved. This is especially important if online multipliers were to be integrated into a company's social media applications.

The approaching of the online multiplier can be supported by providing information, which should not be similar to the company's website, but rather pay attention to hints and tricks. Such information can be used to build a status as an expert on online platforms. Therefore, it is relevant for those with an intrinsic lack of recognition. However, care should be taken to avoid the impression that the company "bribes" internet users. Thus, the possible expert status could be at risk due to a loss of credibility within the community. In general, subjective knowledge can be positively influenced by transferring specific information. As shown in this research, an increase in this self-evaluation of those with an intrinsic lack of recognition affects their articulation in communities.

The transfer of exclusive information may be possible if introverted people are integrated better into the innovation process. An example of such an integration would be to

offer an online ideas competition or virtual stock markets. Owing to public competitions' nature, these possibilities could result in the generation of recognition. The motivation to participate should be encouraged by means of measures, such as a list of winners or personal congratulations, which do not put intrinsic motivation at risk, rather than monetary rewards. Additionally, implemented evaluation systems are important to create an expert profile and a stimulation system. Such methods are particularly important when establishing a company-owned community. To date, factors identified to increase "normal" users' use of the internet, such as fast and personal feedback, and a moderator (Wise et al. 2006), are associated with high costs. Motivating people with an intrinsic lack of recognition can therefore lead to a decrease in the financial costs by increasing the user activity.

The results of this research open a wide area future empirical work. First of all, further identification and characterization of online multipliers are required. Owing to multipliers' online activity, they could be identified by means of network analytical methods. Implementing network analytical measures, which could provide a description of positions in networks, such as the user's prestige and centrality, would, however, have to implement on the internet, for example, in discussion forums.

Generally, this study's results should be verified in further studies with different product groups. In addition, scale development is required that will have a differentiating effect between intrinsic and extrinsic aspects of striving for social recognition.

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