The Effects of Network Diversity and Social Norms on Social Structuring: Empirical Evidence from Online Social Networks

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Abstract

Behavior in social groups follows social norms defining what is acceptable and what is not. Prior research has found strong tendencies toward informational isomorphism in online social networks, as social peers seem to establish a shared understanding of what behavior is acceptable. Due to the additive nature of these social norms, individual’s social context gets more restrictive as network diversity increases. As a consequence, individuals organize their contacts into groups, which is referred to as social structuring behavior, to create a less restrictive environment and to avoid violating social norms. While drawing on diversity literature, this study examines the relations between age, social embeddedness, and nationality diversity on social structuring behavior. For that, a matched dataset from Facebook is used. Findings support the important role social norms play in OSN, and that increases in social embeddedness lead to increases in structuring behavior. Implications for IS theory are discussed.

1. Introduction

Online social networks (OSNs) attract increasing scholarly attention [1,2,3]. The user numbers of sites like Facebook continuously increase as online social networking moves from being a Generation Y phenomenon to attract users from all demographics of society. Furthermore, individuals spend considerable time on these platforms as they add additional functionalities, such as gaming, search, and event coordination [4]. In their literature review, Wilson et al. [5] show that social interactions and affiliation behavior are the dominant topics in OSNs. Affiliation behavior describes the deliberate relation to other individuals and entities and is expressed through the “like”-relationship. Entities can take the form of e.g. organizations, brands, person of interest, or causes, and are represented by pages – a virtual presence in OSN that individuals can affiliate with. Previous research has found three incentives for affiliating with pages. First, users maintain access to information the page’s Webmaster produces. Second, individuals affiliate to a page to convey a message to their network peers. For example, connecting to your favorite music genre signals a certain self-image. Third, individuals affiliate to pages to allow the respective information to diffuse in their network [6]. User behavior in OSN is often visible to one’s friends. In particular the establishment of “like”-relationships are announced to one’s friends prominently. It makes one’s friends aware of the page’s existence and its content.

Contradictory to these motivators of affiliation behavior in OSN, previous research has also identified one mitigating factor that discourages individuals from showing their affiliation with pages. According to Karl et al. [7], social norms seem to regulate individuals’ behaviors in OSNs. Arguably, the establishment of social norms in a setting of human coexistence is as unavoidable as it is necessary. As each network member brings his or her own social norms into the OSN, individuals’ networks become more restrictive as the network size increases (“additivity of norms”). This effect further intensifies with increased network member diversity. This has negative implications for information behaviors on OSN. Pariser [8] argues that highly restrictive social norms on OSN lead to the impoverishment of informational exchange: less information is introduced into the network, and users receive less potentially new and valuable information. Users find themselves in a dilemma between the desire to expressing themselves and to avoiding norm breaching. One method to circumvent this problem is to build sub-networks or groups (social structures) within OSNs. Activities in these groups are observed by a smaller number of friends, and thus are exposed to less and thus more predictable social norms. Accordingly, individuals communicating in groups rather than with their whole network are expected to face less risk of violating social norms. Hence, individuals are expected to
make more use of grouping functionality as the diversity of their social context increases. Based on that, we seek to answer the following research question:

**Does social peer diversity increase the use of social structuring features, such as groups, in OSN?**

In the forthcoming we build on attraction-selection-attrition theory [9] and embeddedness theory [10] in hypothesizing that setting up groups and lists enables users to create boundaries of information flow and information exposure, and that with increased diversity of one’s OSN friends come increasingly restrictive social norms. Building on these theories and recent findings in OSN research, we will argue that individuals are incentivized to create groups and lists to overcome this restrictiveness. We refer to this as *social structuring behavior*. Therefore, we investigate whether or not individuals embedded in more diverse networks are more likely to found and/or join groups than their peers in more homogeneous networks.

In doing so, this study will inform about the meaning of social norms to groups and their respective behaviors in OSN. These findings have important implications for society as information access and information diffusion is increasingly based on OSN relationship and functionality. Moreover, this study can complement existing findings on network diversity [11,12,13,14] effects from the offline world, their underlying social norms, and their effect on individual behavior. Furthermore, it contributes towards making design recommendations as grouping functionality is traditionally seen in relation to number of friends. This study, however, posits that it is actually network diversity and the resulting additivity of social norms that motivates grouping functionality in OSN.

**2. Conceptual background**

The following identifies, defines, and delineates the focal concepts, in particular online social networks, social norms, diversity, and social structuring behavior.

**Online social networks** (OSN) are a disruptive technology as they change the way in which individuals socialize online. The growth of social media ad spending in the US confirms this trend by exceeding traditional search ad spending by 34 percent [15]. Valkenburg et al. [16] found that 80 percent of people use social media to keep in touch and communicate with their offline friends.

Social media is defined as “media for social interaction, using highly accessible and scalable publishing techniques. Social media use Web-based technologies to turn communication into interactive dialogues.” [17](p. 433). In this study, we focus on OSNs as a popular example of social media. OSNs allow users to create personal profiles and to connect to others [18]. In recent years, OSNs have become sophisticated platforms that offer functionality far beyond simple connection building [19]. Besides enabling users to create relationships with others, OSNs allow diverse entities to take an active part in deciding what information diffuses within the network. Hence, the meaning of a relationship changed from simple friendship to diverse relationships including notions such as endorsement and liking. Due to the increased attractiveness of the platforms the time spent on OSNs has increased in the past [20]. With this come changes in how we socialize. In particular, we see a transformation from socializing in the “offline” world to socializing in an OSN world [15].

Facebook, with over 1.06 billion [20] users and about four billion pieces of content shared per day, is the world’s most dominant OSN. Much of the social interactions in OSNs are accessible and observable to researchers. This manifests a wealthy dataset of social behaviors in a naturalistic environment [5]. This may explain why data from OSNs is increasingly used to study human behaviors that were previously more difficult to observe [21].

**Social norms** [22,23] are rules describing what behaviors are acceptable. Individuals who violate these rules can be punished with social sanctions [24]. Social norms are propagated through a communicative process. They function as decision-making heuristics. In situations of high uncertainty, individuals can short-cut the identification of appropriate behaviors by simply following the majority’s opinion [25]. On the down side, this often leads to undesired outcomes. The discussion of norms and conformity is hence characterized by the balance between the need for social order and individuals’ rights to disagree. The philosophical concept of a norm has been separated into the collective and the perceived norm [24,25]. Collective norms relate to macro-level social constructs, such as groups, firms, or societies, and define what members of the collective can or cannot do [24](p. 129). Perceived norms are individuals’ understanding and interpretation of the collective norms. Therefore, discrepancies between the collective norms and the perceived norms may exist. Theory has further distinguished between injunctive and descriptive norms [24]. Injunctive norms motivate behavior through the assumption that not following the norm leads to social sanctions. Descriptive norms shape
behavior through the observation that most others behave that way [24](p. 130). In the context of OSNs, a reasonable assumption is that both injunctive and descriptive norms are relevant: individuals may fear social sanctions if they do not conform to the norms (injunctive), and they may also observe their peers’ behavior and derive normative assumptions from it and behave accordingly (descriptive). The effects of descriptive norms on behavior have been studied in the light of several additional moderators [24,25], including self-identification with the reference group, expected outcome benefits, and social approval, and preliminary evidence supports the notion that outcome benefits have an influence [24].

The degree to which an individual assimilates to a group’s normative pressure is referred to as conformity. People conform to social norms because they seek harmony with their social peers [23]. This behavior is also found in OSNs. Brandtzæg et al. [26] argue that each of one’s friends potentially introduces a new set of social norms. The more different a friend is from one’s other friends, the more likely it is that new social norms are introduced. Importantly, social norms are additive, as new norms do not overwrite existing norms but instead accumulate. This implies that more social norms lead to a more restrictive environment. In such environments individuals face an increased possibility of breaching a social norm, and to be punished with social sanctions [27]. In other words, what was okay to say or to share may not be acceptable anymore, after new friends have been added to the network, and have added their understanding of what is okay.

Diversity refers to the distribution of differences among the members of a network with respect to a common attribute [28]. Thus, diversity can occur in different ways as network members may differ in terms of age, gender, education, etc. [29,30,31,32]. In addition, a multitude of theories exists that explain how attribute differences imply (or not imply) diversity. The most prominent approach is the diversity typology by Harrison and Klein [28]. In their study, Harrison and Klein [28] emphasize the importance of precisely defining what kind of diversity is theorized about. According to them [28], diversity can be divided into separation, variety and disparity. Diversity as separation is derived from the social categorization perspective [33] and refers to differences on a lateral continuum representing positions or opinions among team members [28]. Thus, age, beliefs or norms are distinct, but not better or worse. Network members agree or disagree with norms and consequently categorize themselves in- and outgroups. Harrison and Klein [28] refer to their second diversity type as diversity as variety, which is drawn from the information-decision making perspective [34] and represents the composition of differences in kind, source or category. Differences in category mean that there are classifications to which team members belong or not belong to. Examples are nationality, professions, or ethnicity. Contrary to separation diversity, variety diversity cannot be illustrated on a continuum because categories are distinct and team member cannot share more or less of e.g. nationality. The third diversity type is conceptualized as diversity as disparity. It expresses distinct positions on a vertical continuum such as e.g. status, pay, and reputation. Contrary to separation on a lateral (e.g. norms), disparity on a vertical continuum indicates that higher positions are more preferred than lower positions, in other words more pay is better than less.

In this study, we analyze social network diversity and their influence on social structuring behavior. Therefore, we draw on Harrison and Klein’s [28] diversity types in order to conceptualize diversity present in social networks. As we classify social networks as distinct but not better or worse, we focus on diversity as separation (distinct on lateral continuum) and variety (distinct in category) to conceptualize network diversity. The following will outline the theoretical underpinnings of the diversity concept.

Social structuring behavior

On most OSN platforms, sharing a piece of information is by default directed at the general audience. The general audience consists of all one’s social contacts (“friends”). In order to address only parts of one’s friends, most OSN allow users to create and join groups or lists. Activities and communication in a group is separate from communication in the general audience. Accordingly, individuals communicating in groups rather than with their whole network engage in a more private communication. Therefore, setting up groups and lists can be seen as enabling users to create boundaries of information flow and information exposure. We refer to this phenomenon and its enabling technology as social structuring behavior.

3. Hypotheses development

Several theories posit that network characteristics and peer diversity influences information behavior. Social networking theory [35] looks at human networks as nodes and ties. In alignment with social exchange theory [36] it emphasizes the importance of the ties’ characteristics over the nodes’ characteristics in determining the nature of the network. A review of the literature on human information behavior [37]
emphasizes the importance of one’s network characteristics for almost all kinds of human information processing and exchange. Two clusters of theoretical thought emerge: one explains and predicts the positive utility of increased social network size and peer diversity, the other studies its restrictive effects. The attraction-selection-attrition theory (ASA) [38,39] spans both clusters. One the one hand, it explains how specific network characteristics create social and informational utility (attraction) and thus stimulating individuals’ desire to have access to these networks (selection). On the other hand, it explains how the groups’ and the individuals’ characteristics may subsequently diverge and cause a (voluntary or involuntary) separation from the group (attrition). In a similar vein, embeddedness theory [40] posits that individuals’ embeddedness in a social context increases if their characteristics and expectations fit those of their social context. Increased embeddedness provides social utility. Loosing embeddedness is thus associated with sacrifices and hence perceived as undesirable. To prevent loosing embeddedness, individuals aim at maintaining the (perception of) fit. Based on this, we acknowledge that theoretically network diversity and size are linked to a variety of positive (utility) effects. We argue, however, that theoretically network diversity and size are, at the same time, also linked to negative effects. Based on the above-outlined literature on social norms, conformity, attraction-selection-attrition and social embeddedness, we see a strong link between diversity and the perception of social norm complexity. In other words, increases in one’s social network diversity have the negative side effect of making the present social rule system complex and less predictable. Although an infinite set of other possible diversity attributes exists (e.g. other demographic or occupational factors), prior literature describes three specific types of diversity as dominant for predicting the perception of social norm complexity [41,42,43]. These studies build on self-categorization theory and identity theory for deriving differences in effect sizes among these diversity types. 

**Nationality** as a separation criterion has been shown to have a dominantly strong increasing effect on the perception of social norm complexity [41,44]. Similarly, age diversity [42], and diversity in social network embeddedness [43] have been shown to be dominating factors. By concentrating on these factors – nationality, age, and embeddedness diversity – we are aligned with the prior literature that posits that these diversity types have the strongest effect on perceived social norm complexity in the offline world. We thus choose these three diversity types for our subsequent theorizing.

**The effect of age diversity on social structuring behavior**

Previous research has shown that individuals perceive individuals of the same age as more likely to share their values and norms [45,46]. Consequently, higher age diversity within a network leads individuals to expecting a more diverse social norm environment and more complex and restrictive environment in general. Hence, individuals facing high age diversity within their social network are expected to engage in social structuring behavior to overcome the imposed restrictions of social norms and the risk of violating these norms. Therefore, we formulate:

**Hypothesis 1:** Age as separation-diversity is associated with increases in social structuring behavior in OSN.

**The effects of embeddedness diversity on social structuring behavior**

The notion of social embeddedness refers to how well someone is connected within a social network. Because social embeddedness describes the position of individuals lateral to each other (differences in number of friends) without making quality assumptions (better, worse), it meets the above-introduced criteria for being a separation-diversity phenomenon. We hence classify social embeddedness as type of separation diversity. [47] use the term structural embeddedness for referring to the overall structure of the network and the extent of mutual connections among individuals. Higher embeddedness implies a denser network and that individuals have access to more information about fellow network members [47]. People with many friends who also have many friends are more socially embedded than people with many friends who in turn only have few friends. This is in line with the tenets of embeddedness theory and the conceptualization by Mitchell et al. [48], who describe embeddedness as the position and connectedness of individuals in a contextual web [49]. Importantly, a theoretical linkage between embeddedness and an increase on social norm and value diffusion along the social network is evident [47]. In line with these findings from the offline world we argue, that as social embeddedness among network members increases, member characteristics get more diverse. Hence, the number of restrictive social norms increases and individuals are more likely to perform social structuring. In sum, we posit:
Hypothesis 2: Increases in social embeddedness as separation-diversity are associated with increases in social structuring behavior in OSN.

The effects of nationality diversity on social structuring behavior

In the offline-world, it has repeatedly been shown that individuals (often falsely) perceive others’ social norms as more predictable if they belong to the same nationality. Previous work identified that individuals use language, culture, and traditions as a heuristic [50]. Consequently, individuals of different nationalities are more likely to introduce more diverse social norms leading to an environment that is perceived as less predictable. In the presence of uncertainty regarding the social norms, a tendency towards restrictive network environment emerges as individuals “play it safe”. To break out of these restrictive environments and in order to facilitate less restrictive conversations, individuals in very diverse networks in terms of nationality are expected to increasingly perform social structuring behavior. Hence we formulate:

Hypothesis 3: Nationality as variety-diversity is associated with increases in social structuring behavior in OSN.

4. Methodology

4.1. Sample and data collection

This study employs a unique, matched dataset gathered through an online questionnaire that is linked to the participants Facebook data. First, a questionnaire that assesses the participant’s disposition on the Big-Five personality taxonomy [51] is administered. This questionnaire consists of 41 self-rating questions that place the participants on the dimensions of openness, conscientiousness, extraversion, agreeableness, and neuroticism [51]. After completing the questionnaire participants receive their personality scores. Second, while participants fill in the questionnaire we ask to access and store relevant parts of their Facebook data. Participants use the app voluntarily, and they are informed about the study’s purpose as well as the data handling. Furthermore, the participants give their informed consent. They can deny participating in the study but still receive the benefit (obtain personality scores). The authors have developed the underlying software. The final dataset comprises of 5,437 individuals, which are all members of 34 separate social networks of focal individuals’ from the United States, who completed the questionnaire, confirmed the informed consent, and allowed access to their Facebook data.

4.2. Descriptive statistics

Table 1 provides the means, standard deviations, and correlations of the measures and variables used in the study. The dataset comprises 21 focal women and 13 focal men. Participants are on average 40 years old, ranging from 20 to 57 years. The minimum (maximum) number of friends in our dataset is 26 (557) and 160 on average. The number of pages a participant likes represents the affiliation behavior. On average participants connected to 154 pages ranging from 6 to 767 pages per participant. Additionally, participants’ trait openness scores lie in the interval from 27 to 47 with a mean of 38. Considering group memberships, participants belong on average to 4 groups with a minimum of 0 and a maximum of 17 groups.

Counterintuitively, we see that openness is – though not statistically significant – negatively correlated to social structuring behavior. All other variables show a positive relation with social structuring, with age, number of friends, and social embeddedness diversity exhibiting significant effects. As social embeddedness and nationality diversity reveal a significant correlation, we checked for variance inflation factors in the further analysis to verify that both are distinct concepts.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>39.62</td>
<td>10.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>.38</td>
<td>.49</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>38.00</td>
<td>4.78</td>
<td>-.27</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page likes</td>
<td>153.59</td>
<td>159.06</td>
<td>.14</td>
<td>.02</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of friends</td>
<td>159.91</td>
<td>119.00</td>
<td>.12</td>
<td>-.11</td>
<td>-.30*</td>
<td>.32*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age diversity</td>
<td>12.07</td>
<td>3.05</td>
<td>.47***</td>
<td>-.03</td>
<td>-.13</td>
<td>-.09</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social emb. div.</td>
<td>478.82</td>
<td>269.17</td>
<td>.25</td>
<td>.26</td>
<td>-.02</td>
<td>.25</td>
<td>.44***</td>
<td>-.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nationality diversity</td>
<td>.13</td>
<td>.15</td>
<td>.03</td>
<td>.21</td>
<td>.22</td>
<td>-.04</td>
<td>.40**</td>
<td>-.18</td>
<td>.58***</td>
<td></td>
</tr>
<tr>
<td>Social structuring</td>
<td>3.76</td>
<td>3.99</td>
<td>.29*</td>
<td>.05</td>
<td>-.13</td>
<td>.25</td>
<td>.43**</td>
<td>.10</td>
<td>.35**</td>
<td>.15</td>
</tr>
</tbody>
</table>

**p < .01; *p < .05; *p < .1 Variables 1-5 control variables, 6-8 independent variables, 9 dependent variable.**
4.3. Measures and operationalization

**Dependent Variable.** Social structuring behavior is our dependent variables (DV), and it is operationalized as individuals’ usage of Facebook’s grouping feature. Individuals can belong to groups in two different ways. First, individuals can create groups (“founder”). As the founder of a group, individuals can choose the title, the description, and the logo of the group, as well as who has access to the group. Second, individuals can join existing groups either through invitation or through searching the public groups directory. In the latter, the individual is not able to edit the group’s title, description, etc. In this study, we measure social structuring as the total number of group memberships of each participant.

**Independent Variable.** Diversity is our independent variable (IV). Based on the theoretical considerations described in section 3, we operationalize three different types of diversity to estimate their effects on social structuring. Harrison and Klein argue that the conceptualization of a particular diversity attribute should determine its operationalization [28]. First, we conceptualize age diversity as separation diversity, since age represents a distinct attribute among network members on a lateral continuum. Moreover, diversity as separation refers to deviances from a group mean on an interval scale. As these deviances are captured by the standard deviation [28], this measure is employed to calculate age diversity as separation diversity. Second, we conceptualize social embeddedness diversity as separation. Social embeddedness captures the number of friends all direct friends of the participant have. Similarly to age, social embeddedness diversity requires an interval scale on a lateral continuum, and refers to the differences from the average number of friends in the study’s participants’ networks. Hence, we employ the standard deviation to estimate social embeddedness diversity as separation diversity. Third, we conceptualize nationality diversity as variety diversity. Contrary to separation, interval scaled operationalizations are not meaningful, as we are interested in the spread of network members across different categories (in this case *nationalities*). Therefore, we employ Blau’s [52] index of heterogeneity, also known as Hirschman’s [53] index, which captures the diversity effects of categorical variables [28]. Blau’s index is defined as $1 - \Sigma p^2$, where $p$ represents the proportion of network members of a specific nationality and $k$ is the number of different nationalities in the network. Due to the focus on the United States, we define two different categories, USA and Non-USA Facebook friends, for which the diversity index is estimated.

**Control variables.** Individuals who are more active on OSNs are expected to perform more social structuring behavior compared to their less active peers. We hence need to control for the individuals’ degree of OSN activity, and use the individual’s number of friends as a proxy for it. Because OSN usage intensity might influence the presence and degree of social structuring behavior we seek to control for it. We follow Wilson et al. [5] in taking individuals’ number of page likes as an indicator for their OSN usage intensity. In addition, we control for the

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV: Diversity</td>
<td>Embeddedness diversity</td>
<td>Degree to which the number of social links maintained differs within the <em>friends</em> network</td>
</tr>
<tr>
<td>Nationality diversity</td>
<td>Degree to which nationalities differ within the <em>friends</em> network</td>
<td>Variance and proportion of nationalities among <em>friends</em> in the social network (graph)</td>
</tr>
<tr>
<td>Age diversity</td>
<td>Degree to which age differs within the <em>friends</em> network</td>
<td>Variance in the presence of <em>friends</em> belonging to different age groups</td>
</tr>
<tr>
<td>DV: Social structuring</td>
<td>Activity aiming at creating and maintaining semi-private channels within the OSN, and moving (parts of) the OSN communication away from the broadcast paradigm into these semi-private channels.</td>
<td>Intensity of using the <em>group</em> functionality of the OSN</td>
</tr>
</tbody>
</table>
personality trait of openness [51], as high degrees of openness were found to be an indicator of high OSN usage intensity [54]. Openness scores range from 10 to 50, with higher scores reflecting greater trait openness. Additionally, we introduce age as a control variable to account for the fact that younger individuals are often more aware of the OSN platform’s functionality, which increases their likelihood of being aware of social structuring features. Finally, we controlled for gender to account for possible difference in OSN behavior between men and women. Table 2 summarized these operationalizations.

4.4. Analysis

We introduced the concepts of diversity and social norms, and how they are theoretically linked to changes in individuals’ behaviors. As networks become more diverse, social norms become more restrictive. Based on theory we hypothesized that this motivates individuals to perform social structuring behavior. We articulated a set of hypotheses that we tested empirically.

The dependent variable is estimated as the total number of group memberships reflecting the social structuring behavior. Thus, the dependent variable is always represented by nonnegative integers and is concentrated around discrete numbers of group memberships 0, 1, 2, 3, and so on. Therefore, in order to address potential problems of heteroscedasticity we employ the Poisson distribution, which is feasible for count data and results in unbiased estimates [55].

Table 3 Poisson regression on social structuring

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.466 (1.006)</td>
<td>-.486 (1.030)</td>
<td>-.341 (1.033)</td>
<td>-.899 (1.150)</td>
</tr>
<tr>
<td>Age</td>
<td>.022** (.009)</td>
<td>.022** (.011)</td>
<td>.016 (.012)</td>
<td>.017 (.012)</td>
</tr>
<tr>
<td>Male</td>
<td>.134 (.189)</td>
<td>.138 (.194)</td>
<td>.072 (.197)</td>
<td>.089 (.195)</td>
</tr>
<tr>
<td>Openness</td>
<td>.006 (.022)</td>
<td>.006 (.022)</td>
<td>-.003 (.022)</td>
<td>.012 (.026)</td>
</tr>
<tr>
<td>Page likes</td>
<td>.001 (.001)</td>
<td>.001 (.001)</td>
<td>.001 (.001)</td>
<td>.000 (.001)</td>
</tr>
<tr>
<td>Number of friends</td>
<td>.003*** (.001)</td>
<td>.003*** (.001)</td>
<td>.002*** (.001)</td>
<td>.003*** (.001)</td>
</tr>
<tr>
<td>Age diversity</td>
<td>.003 (.040)</td>
<td>.019 (.042)</td>
<td>.019 (.042)</td>
<td>.010 (.042)</td>
</tr>
<tr>
<td>Social embeddedness diversity</td>
<td>.001* (.000)</td>
<td>.010** (.000)</td>
<td>.001** (.000)</td>
<td></td>
</tr>
<tr>
<td>Nationality diversity</td>
<td>-1.029 (.905)</td>
<td>-1.029 (.905)</td>
<td>-1.029 (.905)</td>
<td>-1.029 (.905)</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>.1468</td>
<td>.1468</td>
<td>.1605</td>
<td>.1666</td>
</tr>
<tr>
<td>LL</td>
<td>-91.25</td>
<td>-91.25</td>
<td>-89.78</td>
<td>-89.13</td>
</tr>
<tr>
<td>AIC</td>
<td>194.50</td>
<td>196.49</td>
<td>195.56</td>
<td>196.26</td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
</tbody>
</table>

***p < .01; **p < .05; *p < .1
These estimates are presented in Table 3.

In order to test our hypotheses we performed the following steps. First, we introduced the control variables age, the gender dummy male, the openness score, the number of page likes, and the number of friends. In the second model, we incorporated age diversity as separation. Next, we introduced the social embeddedness diversity in model 3. Finally, we included nationality diversity in model 4.

Although, we derived the diversity constructs as distinct concepts from theory, we checked for multicollinearity to verify if statistically all constructs are distinct. For that, we checked the correlation matrix (cf. Table 1) and calculated the variance inflation factors (VIF) [56]. Both, the correlation matrix (r < .58) and the variance inflation factors (VIF < 2.34) exhibited highly satisfying results, showing that the regression assumptions are not violated [57].

5. Results

The results of the Poisson regression analysis are presented in Table 3. As the fit statistics we used the McFadden's Pseudo R², the Akaike information criterion (AIC), and the log-likelihood (LL). The AIC builds on the LL, but punishes for further explanatory variables [35]. From the Pseudo R² we see that we have a very good model fit (Pseudo R² = .1666), which improves from model 1 (LL = -91.25) to model 4 (LL = -89.13). From the AIC we see that age and nationality diversity exhibits not the expected explanation power. Among the control variables only the number of friends exhibits a significant positive effect on performing social structuring behavior throughout all models. This finding is in line with the assumption that individuals with more Facebook friends tend to be more active on OSN and to have more group memberships.

Hypothesis 1 states that age as diversity as separation has a positive effect on social structuring. This relationship, however, revealed no significant
effect ($\beta = .010, p > .1$) and therefore the analysis suggest rejecting hypothesis 1.

Second, we investigated the relationship between social embeddedness diversity and social structuring and proposed in hypothesis 2. Results show a significant positive effect ($\beta = .001, p < .05$) of social embeddedness on social structuring. Therefore, findings suggest not rejecting hypothesis 2.

Finally, we investigated the impact of nationality diversity on social structuring. This relationship is proposed in hypothesis 3. Results, however, reveal no significant effect of nationality diversity on social structuring. Thus, findings suggest rejecting hypothesis.

In the following section these findings and their implications are discussed.

6. Discussion

The establishment of social norms in settings of human coexistence is as unavoidable as it is necessary [7]. In every human interaction social norms regulate which behavior is accepted and which is not. For offline scenarios researchers from various fields have studied the phenomenon [22,23]. Because the phenomenon is also present in online settings – and particularly in OSNs – it was the purpose of this paper to shed light on the underlying theoretical mechanisms.

We built on existing literature on social norms, and followed Cialdini and Goldstein [22] in seeing social norms as accepted rules that regulate which behaviors are either accepted or sanctioned by the social group [24]. Due to the additive nature of social norms more norms lead to more restrictive environments. Additionally, network member diversity is argued to introduce more social norms and consequently a higher number of restrictions, e.g. due to cultural differences.

Based on this, we reasoned that in order to avoid social norm violations individuals embedded in very diverse networks are more likely to perform social structuring behavior. While controlling for general OSN activity and the number of friends, our findings have shown that highly socially embedded individuals exhibit a significantly higher likelihood of performing social structuring behavior.

Contrary to our hypotheses, age and nationality diversity do not exhibit significant effects on social structuring behavior. First, this shows that the different social norms introduced by individuals of different ages are not as high as expected. A potential explanation is that age might be perceived a lesser discriminator amongst people in OSNs than in the offline world. Furthermore, age may not predict differences in behaviors in OSNs as good as in the offline world: in order to actively use an OSN individuals have to meet certain minimum requirements, as for example the knowledge of how to register to the service. Therefore, individuals of different ages share at least some basic technology affinity, which might lead to the convergence of behaviors of different age groups. Second, nationality diversity did not have the expected effect on social structuring behavior. This might be due to our operationalization of the construct. For our study we focused on US Facebook users. The majority of their friends are also US citizens. Therefore, classified nationality as US and Non-US individuals. As the US category represents all 50 states of the US, this classification assumes that social norms are similar between these states. This might lead to an underestimation of the diversity effect. Therefore, it is suggested to divide the nationality diversity variable in even smaller categories in the future.

Our study makes three significant contributions. First, it is theoretically developed that social norms play an important role in the social life and that it has a significant impact on ones behavior. This insight from the offline world is extended by our results that social norms also have an influence on individuals behavior in the online world.

Second, our findings suggest that increases in social norm restrictiveness caused by increases in social embeddedness increase the likelihood of social structuring behavior. In this regard, we provide evidence for individuals being embedded in highly restricted environments circumventing this problem by making increased usage of social structuring functionality. This implies that the characteristics of one’s social network determine the nature of the prevalent norms. Furthermore, it shows that social norms have real effects on human online behavior. In particular, they restrict human behaviors and information flows, and thus increase the propensity to engage in social structuring behavior.

Third, this paper contributes to existing but still developing research on the concept of human diversity [23]. While Harrison and Klein [28] established a profound framework to guide diversity research, only few studies have tested this framework empirically. As we employ two conceptualizations of this framework – separation and variety – we advance this theoretical concept. Moreover and to the best of our knowledge, we are the first who transferred this framework to an online setting for empirically investigating diversity effects on behavior. Our results support the assumption that network diversity complicates the information exchange and interaction process in OSN, as network
diversity leads to a multitude of social norms being prevalent in one’s network. Due to the additivity of social norms this leads to increased restrictiveness. Increased restrictiveness stands in opposition to information flow and exchange, and hence incentivizes to engage in social structuring behavior.

The presented findings have multiple implications. For scholars, this study demonstrates that OSNs provide a naturalistic setting, in which human behaviors are observable and documentable. Specifically, it demonstrates how questionnaires can be combined with OSN data access. For practitioners, this study emphasizes the importance of fit between the information content (e.g. brand information) and the characteristics of the social context the information is posted to. As information diffusion in OSNs has become an important success metric for online marketers the question of “what makes a message diffuse” becomes relevant. Previous research has emphasized message characteristics [58]. We draw attention to the social norms prevalent in the audience, as users’ reluctance based on the fear of breaking a social norm. This implies that it is not only the characteristics of the message and the characteristics of individual user, but also the characteristics of the user’s social context (friends) that is decisive, as this is where social norms are established and take effect.

Consequently, it appears to be beneficial for brands to identify specific groups, in which, for example, showing endorsement for their products is accepted, and consequently, to put all advertisement efforts to these groups. Otherwise advertisement spending might yield no effect, as individuals are reluctant to show their affiliation to a brand, product, organization, topic, etc. due to network-imposed restrictions. The identification of key network members who are willing to risk breaking social norms may be a future research stream that supports brands in identifying these important informational multipliers.

7. References


