The Changing Psychology of Culture in Germany: A Google Ngram Study

Nadja Younes | Ulf-Dietrich Reips

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All processes within our society are based on decisions – whether they are individual or collective decisions. Understanding how these decisions are made will provide the tools with which we can address the root causes of social science issues.

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Abstract

The paper provides evidence for the long-term affiliation between ecological and cultural changes in Germany, based on the assumptions derived from social change and human development theory by Greenfield (2009). Greenfield (2009, 2013) assumes that the increase in urbanization is associated with significant cultural changes of psychology. Whereas urbanization is linked to greater individualistic and materialistic awareness, rural environments are strongly associated with allegiance, prevalence of religion, and intense feelings of belonging and benevolence. Due to a similar rate of urbanization in Germany compared to the US, this study aims to replicate the results of Greenfield (2013) for Germany and to improve on the method. Results indicate that prognoses about the implications of an urbanizing population for the psychology of culture hold true. Individualistic values increased, whereas collectivistic values decreased. Further, a predictable reversal for the time during and after World War II is observed, reflecting Nazi propaganda and influence.

Keywords: Google Ngram, social change and human development theory, urbanization, internet science
Introduction

In *Gemeinschaft und Gesellschaft*, Tönnies (1887/1957) presented a normative theory that contained ideal types of a social organization. His conception of a social systems’ nature relies on the distinction between *Gemeinschaft* (community) and *Gesellschaft* (society). *Gemeinschaft* is characterized by a rural environment, simple face-to-face relationships, low technological progress and a life rather in need than in wealth. Moreover, in a *Gemeinschaft* education is not a main focus of parenting and primarily takes place at home. On the other hand, he defines *Gesellschaft* as an urban environment – a modern society with high levels of technology and wealth. Whereas the bonds of family and religion are weaker, economies are not only oriented towards subsistence, but towards commercial growth. Additionally, education becomes an important aspect of a child’s life and takes place at schools. Tönnies’ (1887/1957) understanding of *Gemeinschaft* and *Gesellschaft* built the cornerstones of Greenfield’s (2009) *social change and human development theory*, which suggests that changes in sociodemographic ecologies impact on cultural values and influences learning and development. In particular, Greenfield (2009, 2013) considers urbanization as representative of a *Gesellschaft’s* paradigm. Thus, a change in urbanization is assumed to reflect a sociodemographic change. Within the last centuries, the rate of urbanization has increased drastically not only in the US and European countries but globally (Bähr, 2007).

![Figure 1](image.jpg)  
**Figure 1.** Global development of urbanization rate, i.e., the percentage of urban population, from the years 1800 to 2000 (adapted from Bähr, 2007).
Figure 1 highlights the degree of urbanization in several, diverse countries. Related to the industrialization in Europe and the US, massive migration from rural to urban regions led to a strong increase in the urbanization rate, i.e., the percentage of urban population. For the UK, the graph displays a stiff raise, mainly due to an immigration surplus for the years after 1825. Beginning in 1890, urbanization becomes less and slightly decreases in the subsequent years starting from 1950. However, Germany and the US show a continuous increase (cf. Bähr, 2007). For the UK, the US and Germany, 80% to 90% of all inhabitants can be associated to urban environments whereas India, Kenya and Nigeria display urbanization rates of approximately 30% to 50%. While in 2000, the US shows an even lower urbanization rate than Japan, the Dominican Republic has increased most significantly over the reported time. India still has the lowest urbanization rate. In total, the global trend goes into the direction of urbanization and therefore into the direction of Gesellschaft (Lerner, 1958). Based on this shift, Greenfield (2009) assumes a significant change in cultural values, off from Gemeinschaft towards Gesellschaft. In this paper, we contribute to the existing literature by demonstrating that besides the US and UK (Greenfield 2013), Germany also moved from Gemeinschaft towards Gesellschaft during the last two centuries.

To provide evidence for a long term cultural change in values, we use Google Books Ngram Viewer. By searching millions of books, the online graphing tool allows to quantitatively analyze the change in word frequency and thus the shift in cultural trends (Michel et al., 2011). Although the tool allows to analyze only the general impact of value changes in German-speaking countries, Germany was and is by far the largest country with German as official language. Most publishers of German books are based in Germany.

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1 In this graph, UK includes only England and Wales.
Therefore an observed change in values based on a change in the frequency of German words recorded in books is most likely attributable to Germany and its population.

**Theoretical Background: Social Change and Human Development Theory**

The theory of social change and human development by Greenfield (2009) aims to provide an explanation for the transformation of cultural values and development through changes of sociodemographic conditions. One important trigger of sociodemographic changes is urbanization. Greenfield (2009) uses Gesellschaft and Gemeinschaft as cornerstones for depicting sociocultural ecologies as prototypes. Thereby, each type is defined by contrasting characteristics with respect to, e.g., technology and prosperity levels, religious awareness, economic system, dealings with social relations, and educational importance. In line with Tönnies (1887/1957) and Redfield (1941), Greenfield (2009) assigns values such as, e.g., obligations and conscientiousness, general welfare, and a lifestyle according to religious duties (cf. Chalfant & Heller, 1991) to Gemeinschaft, i.e., the focus lies on the community. In contrast, feelings, desires, and personal aspects are most important in a Gesellschaft (cf. Inglehart & Baker, 2000; Kraus et al., 2012; Manago, 2012), i.e., the focus lies on the individual. Additionally, in a large Gesellschaft, several Gemeinschaften can co-exist (Greenfield, 2013). Greenfield (2009) points out that in a Gesellschaft, individuals of lower social status as well as those living in rural areas, are rather associated to a Gemeinschaft than a Gesellschaft with its respective values. Therefore, it is assumed that individuals of lower status are more liberal, benevolent, and socially interdependent than people of higher status (Kraus et al., 2012). The theory assumes that ecological changes will impact values, behaviors, and psychology. Therefore, the move in the direction of Gesellschaft should lead to a more materialistic and individualistic system of values, behavior and psychology, due to an increase in urbanization, wealth, technological progress, or better educational systems (Greenfield, 2009; Uhls & Greenfield, 2011). Based on this theory and the fact that the German urbanization rate highly
correlates with the rates of the US and UK (cf. Figure 1), we argue that Greenfield’s (2013) results should be applicable to Germany. Thus, we state the following hypothesis:

As urbanization in Germany significantly increased over the last two centuries, a change in cultural values, off from Gemeinschaft towards Gesellschaft is presumed.

**Methodology and Procedure**

To investigate our hypothesis, we apply and extend the methodology of Greenfield (2013). Thus, we examine the change in word frequency in German books to measure changes in cultural values, using Google Books Ngram Viewer. In 2004 Google Books constructed a corpus of digitalized texts containing approximately 15 million of 129 million book editions. These books, published in the 1500s up to 2008, contain approximately 500 billion words in 7 languages, namely German, French, English, Spanish, Russian, Chinese, and Hebrew. For our study of German terms we can rely on a corpus of around 37 billion words. Whereas early centuries include only a few books per year, the main publication time span ranges from 1800 to 2000. Google Books Ngram Viewer computes word frequency by dividing the number of a respective words’ yearly instances by the total number of words in the respective year (Michel et al., 2011).

To make our study optimally comparable and to ensure a qualitatively equal sample, the same time span as selected by Greenfield (2013) is chosen. Thus, we examine word frequencies between 1800 and 2000. With respect to our choice of expressions, high frequency words as selected by Greenfield (2013) will be chosen. This assures that graph lines would rise above zero and thus indicate cultural change over time. Nevertheless, due to a large difference in the corpus of digitalized words², the frequency of German words is not always as high as for English words (Michel et. al, 2011). Similar to Greenfield (2013), we examine nouns and their

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² The corpus of digitalized texts in English contains 361 billion words compared to 37 billion in German.
adequate verb or adjective synonyms in order to make sure that the “chronological patterning […] was a function of the underlying construct” (Greenfield, 2013, p. 5). To prevent any potential distortion of results we also avoid selecting words with a broad interpretation leeway.3

As ecological conditions trigger cultural changes, Greenfield (2013) shows that a changing rate of urbanization, which measures a change of ecological condition, is a potential driver of a change in values. Due to a very similar rate of urbanization in Germany (cf. Figure 1), the change in word frequency should be similar to Greenfield’s (2013) US and UK results. In order to test this assumption, urbanization is operationalized with the words displayed in Table 1.

**Table 1. Overview of value-carrying words, representing Gemeinschaft and Gesellschaft**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Gemeinschaft</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>obliged</td>
<td>choose</td>
<td></td>
<td>auswählen</td>
<td>Entscheidung</td>
</tr>
<tr>
<td>duty</td>
<td>Pflicht</td>
<td></td>
<td>bekommen</td>
<td>Kauf</td>
</tr>
<tr>
<td>give</td>
<td>versprechen</td>
<td></td>
<td>get</td>
<td>spüren</td>
</tr>
<tr>
<td>benevolence</td>
<td>geben</td>
<td></td>
<td>acquisition</td>
<td>Emotion</td>
</tr>
<tr>
<td>act</td>
<td>handeln</td>
<td></td>
<td>feel</td>
<td></td>
</tr>
<tr>
<td>deed</td>
<td>Handlung</td>
<td></td>
<td>emotion</td>
<td></td>
</tr>
<tr>
<td>obedience, authority,</td>
<td>Gehorsam, Amtsgewalt,</td>
<td>individual, unique,</td>
<td>individuell, einzigartig,</td>
<td></td>
</tr>
<tr>
<td>pray, belong, power,</td>
<td>beten, gehören, Macht,</td>
<td>child, self, personal</td>
<td>Kind, Selbst,</td>
<td></td>
</tr>
<tr>
<td>worship, join,</td>
<td>Verehrung, zugesellen,</td>
<td>ego, baby, special</td>
<td>persönlich, Ego, Baby,</td>
<td></td>
</tr>
<tr>
<td>conformity</td>
<td>Gleichförmigkeit</td>
<td></td>
<td>speziell</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Column I and II present Gemeinschaft words selected by Greenfield (2013). Column III and IV display German words, equivalent to Greenfield’s (2013) Gemeinschaft words. Column V and VI show Greenfield’s (2013) Gesellschaft words, with equivalent German words, provided in Column VII and VIII.*

Table 1 presents an overview of words selected by Greenfield (2013) and their German equivalents. In a first step, English words are translated into German, using *Oxford German Dictionary* and *Duden*.4

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3 Words could be used in many contexts, e.g., the German word “Bank” could be used to describe a furniture (bench) or a financial institution (bank).

Additionally to Greenfield’s (2013) procedure, and as an improvement to the method, we ensure that the specific choice of translated words is not a potential driver of results, by collecting three synonyms for each of the terms using the online dictionary *Wortschatz* by the University of Leipzig.\(^5\) For each of the terms we further test the first three synonyms listed in *Duden Synonymwörterbuch* (2014) to ascertain that results do not depend on subjectively selected synonyms. In total, Greenfield (2013) uses synonyms for selected words in order to make sure that the results do not arise idiosyncratically from particular words. Our respective checks confirm most results remain stable for synonyms, but it needs to be noted that too small of a selection of words could create a wrong impression.

![Figure 2](image)

**Figure 2.** Frequency of the words “ritual” and “worship” in the Google corpus of American English books from the years 1800 to 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.

Figure 2 highlights this problem. Replacing Greenfield’s (2013) “worship” with “ritual”, the picture changes completely and the predicted decrease turns into an increase. The same problem is displayed in German. By substituting “Verehrung” (worship) with “Kult” (ritual) the story changes and an increase instead of a decrease is displayed. Including a predefined number of and procedure for selecting synonyms with our investigation we hope to increase the robustness of our findings.

\(^5\) Cf. [http://wortschatz.uni-leipzig.de/](http://wortschatz.uni-leipzig.de/)
Results

The first contrasting words and underlying values that were examined by Greenfield (2013) are “obliged” and “duty”, respectively (Gemeinschaft adaption) and “choose” and “decision”, respectively (Gesellschaft adaption). While the first two words show a decrease over time the last two words exhibit an increase. In order to examine the respective value change for Germany, we selected “versprechen” (promise) and “Pflicht” (duty) as well as “auswählen” (choose) and “Entscheidung” (decision).

![Figure 3](image)

**Figure 3.** Frequency of the words “Pflicht” (duty) and “Entscheidung” (decision) in the Google corpus of German books from the years 1800 to 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.

Figure 3 shows the difference in word frequency over the time span 1800 to 2000. In line with the results of Greenfield (2013), the relative word frequency of “Entscheidung” almost tripled, whereas “Pflicht” displays an approximately 5-fold decrease over time. Similar results are obtained for the verbs “versprechen” and “auswählen”.

The difference between getting something for oneself (Gesellschaft adaption) and contributing to common good (Gemeinschaft adaption) is represented by the words “get” and “acquisition” as well as “give” and “benevolence”, respectively. Greenfield (2013) obtained for both, the US and UK, a decrease for the first and an increase for the latter term. The
respective German terms are “Güte” (benevolence) and “geben” (give) as well as “Kauf” (acquisition) and “bekommen” (get).

Figure 4. Frequency of the words “Güte” (benevolence) and “Kauf” (acquisition) in the Google corpus of German books from the years 1800 to 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.

As suggested, due to the increase in urban population, Figure 4 shows the Gesellschaft adapted word “Kauf” increased over time, whereas “Güte” decreased drastically. However, between 1940 and 1950, an increase in “Güte” is displayed. This might be due to (the end of the) World War II in 1945. While conformity and equality were highly propagandized within World War II, to return to normal life, benevolence among people was of utmost importance after the war. One example is Trümmerfrauen (ruin women), who helped clear and reconstruct bombed cities as part of a new community. In line with these findings, Greenfeld (2013) mentioned a decline in “get” for the US. She assumes that this might represent a decrease in self-interest, based on the entering of the War in 1940. For the wording “geben” and “bekommen” similar patterns are displayed. However, “bekommen” does not increase as strong as “Kauf”. Furthermore, Greenfield (2013) uses “act” and “deed” (Gemeinschaft adaption) as well as “feel” and “emotion” (Gesellschaft adaption) to contrast that in Gemeinschaft individuals appreciate the social world associated with action or behavior, whereas in a Gesellschaft the inner
psychological process is focused. To replicate the findings, “handeln” (act) and “Handlung” (deed) as well as “spüren” (feel) and “Emotion” (emotion) are used.

![Graph](image)

**Figure 5.** Frequency of the words “Emotion” (emotion) and “Handlung” (deed) in the Google corpus of German books from the years 1800 to 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.

Figure 5 presents the results for “Emotion” and “Handlung”. In line with Greenfield (2013), who reports a rise in “feel” and a strong decline in “act”, our German translations display a consistent pattern. However, due to a large difference in scaling, the 4-fold decline in “Handlung” appears graphically stronger compared to the approximate 200-fold increase in “Emotion”. For “handeln” and “spüren” we find similar results. Whereas “handeln” declined over time, “spüren” rose and reached its peak around 1940. In 2000, “spüren” exhibited a more than 5-fold increase since 1800.

Finally, in order to highlight the “child”-centered socialization to a “unique”, “individual”, “self” in a *Gesellschaft*, the quoted words were investigated. To test for robustness, Greenfield (2013) selected “baby”, “personal”, “special” and “ego” (*Gesellschaft* adapted). An overall rise is displayed, whereas words such as “obedience”, “authority”, “belong”, and “pray” with the synonyms “conformity”, “power”, “worship”, “join” (*Gemeinschaft* adapted) are reported to display an overall decrease over time. Thus, due to an increase in rural population, we expect the frequency of words with respect to the individual,
the center of a *Gesellschaft*, to rise. Frequencies of words related to the community, religion and belonging are expected to decline. To replicate Greenfield’s (2013) results the words “individuell” (individual), “einzigartig” (unique), “Kind” (child), and “Selbst” (self) with “persönlich” (personal), “Ego” (ego), “Baby” (baby), and “speziell” (special) as respective synonyms are selected.

Figure 6. Frequency of words indexing *Gemeinschaft*-adapted values from the years 1800 through 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.

Figure 6 presents the predicted decrease in *Gemeinschaft* values by a decline in the frequency of the words “Gehorsam” (obedience), “Verehrung” (worship), “beten” (pray), “Gleichförmigkeit” (conformity), “Amtsgewalt” (authority) and “zugesellen” (join). A similar picture is given for the synonyms “Macht” (power) and “gehören” (belong). However, in contrast to the US and UK, an increase in word frequency of the majority of examined terms is observed for the years between 1941 and 1945. This increase is most likely attributable to the situation during World War II. On the one hand, nazi ideology tried to create a feeling of affiliation, on the other hand total obedience was demanded (Welch, 2004). The observable increase in “beten” and “Verehrung” might be associated with people seeking refuge in God and faith. Figure 7 displays results for words representing *Gesellschaft*, confirming the results
of Greenfield (2013) by presenting a continuous increase for words, associated with the development of a unique individual.\textsuperscript{6}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure7.png}
\caption{Frequency of words indexing Gesellschaft-adapted values from the years 1800 through 2000. The graph was made with the Google Books Ngram Viewer (Michel et al., 2011), with a smoothing of 3.}
\end{figure}

\textbf{Robustness}

To ensure that results are not driven by the choice of translation, we present three synonyms for each translation of Greenfield’s (2013) bunch of words (robustness words) representing Gesellschaft or Gemeinschaft. First, we obtain synonyms from the online tool Wortschatz by the University of Leipzig. With respect to Gesellschaft, we pool Greenfield’s (2013) words by two due to predominant semantic similarities among the words.\textsuperscript{7} According to Wortschatz, some of Greenfield’s (2013) Gesellschaft words are synonyms of each other.

\textsuperscript{6} “Macht” and “gehören” as well as “Kind”, “speziell” and “Selbst” are not displayed in the graphs due to major differences in frequency. However, overall results do not change.

\textsuperscript{7} Any potential semantic difference becomes negligible, as words represent the same values in an identical context.
Table 2. Overview of value-carrying words representing *Gesellschaft*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>personal / individual</td>
<td>persönlich / individuell</td>
<td>privat höchstselbst</td>
</tr>
<tr>
<td>baby / child</td>
<td>Baby / Kind</td>
<td>Nachwuchs Kleinkind</td>
</tr>
<tr>
<td>ego / self</td>
<td>Ego / Selbst</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Column I presents *Gesellschaft* words selected by Greenfield (2013), grouped by two due to semantic similarity. Column II displays German words, equivalent to Greenfield’s (2013) *Gesellschaft* words. Thereby, each word counts as a synonym for the other. Column III and IV provide two further synonyms, obtained from *Wortschatz*.

Table 2 provides an overview of synonyms for Greenfield’s (2013) *Gesellschaft* words. Except for “ego” and “self”, three synonyms for each word can be obtained as follows. We use “individuell”, “privat”, and “höchstselbst” as synonyms for “persönlich”. Further, “persönlich”, “privat”, and “höchstselbst” are chosen as synonyms for “individuell”. Applying the same procedure for each of the originally translated words (e.g., baby, child, ego, self, unique, and special), results remain robust as we observe the predicted theory-based increase over time.

Table 3. Overview of value-carrying words representing *Gemeinschaft*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>obedience</td>
<td>Gehorsam Befolgung Folgsamkeit Gefügigkeit</td>
<td></td>
</tr>
<tr>
<td>authority</td>
<td>Amtsgewalt Befehlsgewalt Hoheit Regierungsgewalt</td>
<td></td>
</tr>
<tr>
<td>pray</td>
<td>beten Flehen erbitten anbeten</td>
<td></td>
</tr>
<tr>
<td>belong</td>
<td>gehören angehören zukommen zugehören</td>
<td></td>
</tr>
<tr>
<td>power</td>
<td>Macht Obrigkeit Regiment Staatsgewalt</td>
<td></td>
</tr>
<tr>
<td>worship</td>
<td>Verehrung Bewunderung Ehrfurcht Anbetung</td>
<td></td>
</tr>
<tr>
<td>join</td>
<td>zugesellen begleiten gesellen anhängen</td>
<td></td>
</tr>
</tbody>
</table>

Note: Column I presents *Gemeinschaft* words selected by Greenfield (2013). Column II displays German words, equivalent to Greenfield’s (2013) *Gemeinschaft* words. Column III to V provide synonyms for each German equivalent, obtained from *Wortschatz*. 
Table 3 reports chosen synonyms for *Gemeinschaft* values. Examining word frequencies of displayed words, the vast majority of synonyms is perfectly in line with theory.

**Table 4.** Descriptive statistics of synonyms obtained from *Wortschatz*  

<table>
<thead>
<tr>
<th></th>
<th>Gesellschaft</th>
<th>Gemeinschaft</th>
<th>Total</th>
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<tbody>
<tr>
<td># of Greenfield’s (2013) robustness words</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td># of translated Greenfield (2013) words</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td># of synonyms obtained via <em>Wortschatz</em></td>
<td>20 (14)</td>
<td>24 (24)</td>
<td>44 (38)</td>
</tr>
<tr>
<td># of synonyms with predicted change in frequency</td>
<td>19 (13)</td>
<td>19 (19)</td>
<td>38 (32)</td>
</tr>
<tr>
<td># of synonyms without predicted change in frequency</td>
<td>1 (1)</td>
<td>5 (5)</td>
<td>6 (6)</td>
</tr>
</tbody>
</table>

*Note:* The number of unique words is put in parentheses.

Table 4 presents descriptive statistics of selected synonyms using *Wortschatz*. In total, more than 85% (38/44) of all chosen synonyms show a change in frequency into the predicted direction. For Greenfield’s (2013) 8 *Gesellschaft* words, 20 synonyms were chosen. Out of these 20 synonyms, 14 words are unique. Only for “Kind” no clear increase could be observed. Additionally, we provide 24 different synonyms for Greenfield’s (2013) 8 *Gemeinschaft* words. The large majority of words shows the expected decrease over time. For 5 synonyms (Befehlsgewalt, Regierungsgewalt, angehören, Staatsgewalt, and Eintönigkeit) no overall decrease is displayed. Except for “Eintönigkeit”, the remaining 4 synonyms show their peaks before 1900 and a stiff decrease in frequency afterwards. The same pattern is observed for “Eintönigkeit” after 1950.

In order to avoid any potential bias from subjectively selected synonyms, we double check robustness by using the first three one-word synonyms for the semantically most adequate grouping listed in *Duden Synonymwörterbuch* (2014). We avoid choosing words that appear to be colloquial, dialect, humorous or obsolete. For *Gesellschaft* words “persönlich”

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8 Based on this procedure we exclude “selber” as a form of “persönlich”, as well as “Bébé”, “Wickelkind” and “Kleinstkind” as synonyms for “Baby”.
and “individuell” we obtain “eigen”, “individuell”, and “privat”, respectively “eigen”, “persönlich” as well as “privat”. For “Baby” we obtain “Kind”, “Neugeborenes”, “Säugling”, and for “Kind” the words “Baby”, “Neugeborenes” as well as “Säugling” are the first three listed synonyms in the dictionary. For “Ego” and “Selbst” no synonyms are given. Synonyms for “speziell” and “einzigartig” are “außergewöhnlich”, “eigenwillig”, and “extravagant” as well as “außergewöhnlich”, “beispiellos”, and “einmalig”, respectively.

With respect to the Gemeinschaft word “Gehorsam” the synonyms “Ergebenheit”, “Folgsamkeit”, and “Fügsamkeit” are listed. No synonym can be obtained for “Amtsgewalt”. For the words “beten” and “gehören” only “bitten” and “flehen” as well as “angehören” and “zugehören” match the criteria for synonyms. Other words for “Macht” are “Ansehen”, “Autorität”, and “Einfluss”. “Anbetung”, “Glaube”, and “Kult” are listed for “Verehrung”, whereas for “Gleichförmigkeit” and “zugesellen” no synonyms are found. Entering each of the synonyms into Google Ngram Viewer shows the majority of words decreases in use over time.

Table 5. Descriptive statistics of synonyms obtained from Duden Synonymwörterbuch (2014)

<table>
<thead>
<tr>
<th></th>
<th>Gesellschaft</th>
<th>Gemeinschaft</th>
<th>Total</th>
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<tbody>
<tr>
<td># of Greenfield’s (2013) robustness words</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td># of translated Greenfield (2013) words</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td># of synonyms obtained via Duden Synonymwörterbuch (2014)</td>
<td>18 (13)</td>
<td>13 (13)</td>
<td>31 (26)</td>
</tr>
<tr>
<td># of synonyms with predicted change in frequency</td>
<td>15 (11)</td>
<td>9 (9)</td>
<td>24 (20)</td>
</tr>
<tr>
<td># of synonyms without predicted change in frequency</td>
<td>3 (2)</td>
<td>4 (4)</td>
<td>7 (6)</td>
</tr>
</tbody>
</table>

Note: The number of unique words is put in parentheses.

Table 5 presents descriptive statistics of chosen synonyms using Duden Synonymwörterbuch (2014). For Greenfield’s (2013) Gesellschaft words we obtain 18 synonyms in total, using the

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9 “Wurm” would have been on third rank but is excluded as “Wurm” could also mean worm in the sense of an animal.

10 We exclude “ausgefallen” as it might be often translated with “out of order”.

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first 3 synonyms listed in *Duden Synonymwörterbuch* (2014). However, as her *Gesellschaft* words are very alike, only 13 of 18 synonyms are unique words. Out of these words, besides “Kind” only “eigen” shows an overall decrease. Nevertheless, substituting “eigen” with the respective inflections “eigene”, “eigener”, or “eigenes” the predicted increase over time is observed. For Greenfield’s (2013) *Gemeinschaft* words, we also obtain 13 different synonyms. “Autorität” and “Kult” show an overall increase with their peaks in 1950. Since that time “Autorität” displays a steep decline, whereas “Kult” has been rising again since 1990. On the other hand, “Fügsamkeit” and “angehören” reach their peaks between 1860 and 1880. From that time, both words show a steady decline.

**Summary**

The theory of *social change and human development* predicts a global shift from *Gemeinschaft* to *Gesellschaft* values due to an overall increase in urbanization. This hypothesis is confirmed by respective shifts in word frequency for the US and UK, plotted by using the Google Books Ngram Viewer (Greenfield, 2013). We replicate these findings for the German language and for Germany as the largest publisher of book in this language. We extend Greenfield’s (2013) methodology by testing for the first three synonyms of each term from e.g., the most widely referenced synonym dictionary for German. Further, we use the time period during and shortly after World War II as a specific historical event to test and again confirm the theory. With respect to *Gemeinschaft* words we observe a temporal reversal for this period. Although the frequency of words representing collectivistic values generally decreases over time, during the period an increase is displayed for many *Gemeinschaft* words. As presumed, Nazi propaganda led to a reversal in published German values, towards a *Gemeinschaft*. Overall, the prediction of the *social change and human development theory* holds true for the German Ngram corpus. Nevertheless, in order to transfer the results for the US, UK, and Germany to a more global level, further languages should be tested.
References


