

# Impact of war on individual life-cycle creativity: tentative evidence in relation to composers

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Received: 26 October 2011 / Accepted: 20 September 2012 / Published online: 6 October 2012  
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**Abstract** The relationship between conflict and individual life-cycle artistic output is ambiguous, both a priori and in terms of the evidence. To address this question in relation to composers, we employ a sample of 115 prominent classical composers born after 1800 and attempt to link their annual productivity with the incidence of wars. While the sample is small and the measure of creative productivity limited, we find evidence that the impact of wars on the timing of individual creative production is significant and negative, in keeping with the evidence on the impact of wars on overall societal creative output.

**Keywords** Productivity · Conflict · War · Composer · Creativity

**JEL Classifications** D24 · D74 · J24 · F51 · O31 · N40 · Z10

## 1 Introduction

In relation to a larger project, details on the movements of over 500 prominent composers in different time periods were collected. This meant that there was information then on where they were during years of war. Information on wars and their duration are available. This led to the interesting question of whether or

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To examine this topic, one crucial further bit of information was required, namely some measure of the creative output of composers. Measures were sought and the only one we could find, even as a very crude proxy, covered 115 of the composers for which we had detailed information on their whereabouts throughout their lives. Nonetheless, this we feel is a start at attempting to provide some empirical evidence on a topic that has interested social scientists, psychologists and historians (see references).

Section 2 of the paper will examine the a priori links, if any, between individual life-cycle creative output and wars. Section 3 will outline the source, and construction, of the three large data sets used in this paper. Section 4 will provide a summary of the key descriptive statistics arising from these data as well as specify the model to be used and outline the main econometric results. Section 5 concludes the paper.

## 2 Possible link between individual life-cycle creativity and war

There are two aspects to this debate. The first is the impact of war on total creative output; the second is its impact on the *life-cycle* output of existing artists. It is the latter question that is addressed in this paper although one might expect the two to be linked. In relation to the first of these questions, several scholars have provided qualitative discussions of history and claim that war and internal unrest have a negative impact on artistic creativity and artists.<sup>1</sup> This should impact of course on individual productivity: if the general conditions of war are not positive for overall creative activity, it is highly unlikely that the work of existing established composers will prosper.<sup>2</sup>

Creativity for our purposes is defined by Feldman et al. (1994, p. 2) as ‘the achievement of something remarkable and new, something which transforms a field of endeavour in a significant way’. They then provide a useful framework for the study of creativity.<sup>3</sup> Of particular interest for our purposes are those factors that concentrate on individual-oriented approaches and especially those theories that attempt to link an individual’s state of mind at a particular time to wider conditions

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<sup>1</sup> For example, see Wright (1942) or Toynbee (1972).

<sup>2</sup> The only statistical evidence that we know of about the impact of wars on individual artistic output is Simonton (1977, 1986), and, in a circuitous way, Hellmanzik (2010). Borowiecki (2013) looked at a different dimension, namely the impact of clustering on life-cycle creative output.

<sup>3</sup> Lehrer (2012) talks about the ‘mystery’ of creativity and points out that the daunting nature of the subject has led researchers to mostly neglect it. His popular book is about how we imagine and hence create. He points out that geniuses are not scattered randomly across time and space but that they tend to arrive in tight, local clusters. He argues therefore that the general cultural environment of a location has a hugely influential role on creative output, and especially so in the case of Shakespeare. See also Borowiecki (2012) and Hellmanzik (2010). An extension of this argument is that wars could also impact on creative output of an individual.

Much has been written on the links between trauma and creative output, the links between mental illness and creative output being an extreme version of this. Andreasen (2005) diagnosed the relationship between creativity and psychopathology in living writers. She argued that mood disorders could possibly be productive and in some instances may provide powerful material upon which the creative person could draw. For example, T. S. Eliot did his best work apparently under mental stress and Einstein also recognised the necessity of the acceptance of lows and highs in his search for scientific breakthrough.

One key issue is whether or not mood changes lead to a greater output, or perhaps a lesser but higher-quality output. Slater and Meyer (1959) with this in mind analysed the output of Robert Schumann. The average number of his works over parts of his life was tracked, and it was found that in his years of hypomania, his output was five times the average number in his years of depression. They then adjusted for the quality of this output, using the number of recordings for each composition as an indicator of quality. The number of recordings though could simply be a measure of popularity and not quality, although the two can be highly correlated. When this adjustment is made, they find that while the number of works increased in Schumann's manic years, there was no apparent increase in the quality of his creativity in these years.

Emery (1993) attempted to explain the links between artistic activity and inner resistance to group regression and tyranny, where the creative self can for example be influenced by the corruption of the surrounding social order or as a check on the tendency to conformity of mass society. His essential argument is that psychologically people respond to trauma through creative production. And it could be argued that war certainly provides trauma and/or a threatening situation, in some cases *in extremis*. As Jamison (1989) says, 'creative work can act not only as a means of escape from pain, but also as a way of structuring chaotic emotions and thoughts, numbing pain through abstraction and the rigors of disciplined thought' (p. 123).

Kaufman and Baer (2002) argue that the adage that creativity and 'madness' are linked together is by and large supported by existing research. One especially well-established connection is that between the writing of poetry and the incidence of mental illness they posit. Akinola and Mendes (2008) argue there is substantial research that shows evidence for strong situational factors influencing creativity. In some cases, intense negative emotions can create powerful self-reflective thought and perseverance, leading to increased creativity. Their work demonstrates that when individuals are biologically vulnerable to experiencing negative effects and are exposed to a situation that brings about intense negative emotion, they show the most artistic creativity.

Another possible positive and non-psychological link between creative quality and war is that artistic output inspired by war often deals with the topic of war, and this subject may have a broad appeal, thereby leading to more monies being provided for artistic activity, especially by established creative artists. Such works

only ones that are based on professional assessment of their creative merit (see later). As such, in this study, works that were simply ‘popular’ rather than musically important are not included.

Simonton (1986) comes closest to the objective of this paper in that it looks at the determinants of aesthetic success in classical music compositions, one of the determining variables being historical circumstances such as wars. His argument as here is that musical composition is often an expression of intense feeling and that as such the timing of great musical compositions is determined by the state of the composer’s frame of mind and that wars clearly have an effect on this, and indeed as argued below on the working circumstances, and hence musical output, of the composer. This would suggest that the experience of war does not necessarily increase creative output, quite the opposite in some cases.

For example, in an earlier study, Simonton (1980) provides a quantitative time-series analysis of the relationship between war and European techno-scientific output, the first such study using annual rather than generational data. Simonton’s results imply a negative association between scientific technological activity and the incidence of defensive wars fought within Europe. This could be explained by Cerulo (1984), who talks about three possible links between war and individual creativity: direct exposure to the war, destruction of communication networks and social-psychological processes. War generates large-scale disruption and instability of the social fabric. Physical threat, destruction and direct attack are highly counterproductive to creative output. As she points out, Vaughan Williams was a fire-fighter during the bombing of London, often being forced to write with his helmet, bucket and pump close at hand. Shostakovich composed right through the air raids on Leningrad, leaving his desk only when on shift duty in the rescue brigade.

Communication networks also break down in war time, and many composers would not have any foreign works available to them because of censorship and broadcasting blackouts. Besides, the adverse effects of war on the music publishing industry cause a decline in the exchange of written material. On top of this, all interpersonal contact, especially with colleagues in the non-war zone, may end, thereby depriving composers of a supportive system and the enforcement by contemporaries of peer review and standards. Cerulo (1984) on the basis of a small and selective sample does find a significant impact of war on the structure of music composition but does not indicate in a musical sense whether or not this led to a higher-quality output.

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<sup>4</sup> Two possible examples of this are the following. First, is the ‘Wellington’s Victory’—an orchestral work that was composed in 1813 by Beethoven to commemorate the Duke of Wellington’s victory over Bonaparte’s forces at the Battle of Vitoria in Spain. The piece, with its fanfares, cannonades and themes from British patriotic songs was thunderously acclaimed, especially in England. Critics regard the composition to be ‘tailored for popular success’, one of the first mass productions that appeared at the ‘dawn of the age (of) modern commercial propaganda’ (Kinderman 2009). A second influential composition, ‘Symphony No. 7’ (also ‘Leningrad Symphony’) was composed by Shostakovich within a month after the Nazis invaded Russia in the year 1941. The composer described the work to be ‘about terror, slavery, and oppression of the spirit’ and the composition became an icon of the resistance, suffering and hopes of the Russian people. Shostakovich’s work received hundreds of performances, both in Russia and abroad.

in terms of access to instruments/concert venues or players to ‘test’ their material. This is less likely to happen to established major creative figures, such as the 115 composers being examined in this paper but as noted above if there is direct exposure to war, communications and interpersonal networks break down which could affect all composers, no matter how important.<sup>5</sup>

### 3 Data sources

Three major data sources were used for this study, and each will now be outlined in turn.

O’Hagan and Borowiecki (2010) documents how the data on the yearly geographic locations of the 522 most important composers were obtained.<sup>6</sup> Their sample was taken from Murray (2003) who used 17 different reference works and histories to calibrate eminence, and in at least one of these sources, 2,508 composers were listed. He then reduced this to 1,571 composers who were mentioned in at least two sources, one of which was a non-encyclopaedic source. In examining these composers, he used the 13 most relevant sources, relevant being defined as one that contained 18 % of the 1,571 composers. He then reduced this to 522 ‘significant’ composers, namely those mentioned in at least half of the 13 sources used. This was the group of composers then for which O’Hagan and Borowiecki sought location data.

The key data source on the location and migration patterns of the 522 composers is the Grove Music Online (2009). This large multivolume dictionary is detailed enough to track the movements of all 522 composers, especially work-related migration, and in fact covers around 15,000 composers in all. It is ‘a critically organised repository of historically significant information’ (Sadie, Grove Music, 1980 edition, xii) and hence was an ideal source, especially as it is also available online. For contemporary composers, 1950 was the year adopted as the cut-off point by Murray (2003), with no composers born after this year included: thus twentieth century from here on refers to composers born in the first half of that century only. The important work of composers though occurs many decades after year of birth, with, for example, the main work of many composers born between 1850 and 1899 taking place in fact in the first half of the twentieth century.

What results is a unique data series that records the country of residence for each composer in every year of his life. In this study, we focus only on the periods of a

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<sup>5</sup> For example, would Richard Wagner’s output have been richer if he had not emigrated because of a civil war—the May Uprising of 1849—from Dresden to an exile in Zurich, where he spent 12 years in isolation from the German musical environment and lived mostly without any notable income? How would the career of Carl Orff have developed if he were not drafted into the army in 1917, when he got severely wounded at the front and almost died due to his injuries? We will never know the answers to these specific questions.

<sup>6</sup> See also Borowiecki and O’Hagan (2012) on their attempts to build a data source on a much larger group of composers, namely the 15,000+ listed in Grove Music Online (2009), but not including detailed migration and work patterns. See also Borowiecki (2012) for a study of the impact of war on migration patterns of composers.

managing music institutions, or travelling in search of inspiration. The aim of this restriction is to analyse the life period in which an individual from the sample was in fact a composer. Hence, the infancy, education and retirement life periods are excluded as well as periods in which only other professions were practised.

The most common method for the measurement of creative product is based on an assessment of expert judges (Plucker and Renzulli 1999). In this research, then we defer to the opinion of experts and obtain the underlying output database from Gilder and Port (1978), in which a qualitative selection of the most important works for 275 prominent classical composers born between 1500 and 1949 is provided. Their work aims to provide a dictionary ‘of lasting value as a permanent reference (...) [that contains] (...) complete factual information about who wrote what and when’ (Gilder and Port 1978, Preface). The selection is intended to include ‘every work of importance’ that ‘may be heard in the concert hall, the opera or ballet house, and the church’. For each composition, Gilder and Port provide the associated date of production, full title and type of work.<sup>7</sup>

The war data set is based on the Correlates of War (COW), a commonly used database introduced and described by Sarkees (2000). The COW data set identifies conflicts within states and between states that occurred between 1816 and 1997,<sup>8</sup> and lists a number of records for each war. The available information enables one to take account of war heterogeneity and to conduct distinctions between various types of war. The composer and war data sets are linked through the country where a composer was located in a given year.<sup>9</sup>

Thus, for the purposes of this study, only the composers who lived during the wars identified in Sarkees (2000) and covered by both Gilder and Port (1978) and O’Hagan and Borowiecki (2010) could be included. This reduced the total that could be studied to 115: a relatively good sample size nonetheless that should allow of reliable estimation.

## 4 Results

### 4.1 Descriptive statistics

For the composers included in this study, we present a summary of the data in Table 1. Composers covered have lived around 68 years, 46 of which they were involved with music-related work. France and the Germanic countries (i.e.

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<sup>7</sup> This authoritative source has also been used by Cerulo (1984) and Simonton (1991).

<sup>8</sup> The COW database covers also extra-state wars, i.e. wars between a state and a non-state entity. However, as none of these wars occurred within the boundaries of any of the countries analysed, we do not include extra-state wars in our study.

<sup>9</sup> Note that for 1816–1918 (for the duration of the Austria–Hungary Union) the COW database aggregates wars in Austria and Hungary. To maintain consistency we also aggregate composers in those two countries for that time period. Analogous to the COW records, we also aggregate composers for Germany and Italy for the period before the unification in 1871 and during the XIX century, respectively.

*A. General characteristics*

Life span (years)	68.4	14.5
Duration of career (years)	45.7	14.3

*B. Birth country*

British Isles	0.09	0.28
France	0.22	0.41
Germanic countries	0.19	0.39
Italy	0.10	0.29
Russia	0.14	0.35
Spain	0.03	0.16
Eastern Europe	0.10	0.29
Rest of Europe	0.04	0.20
USA	0.09	0.28
Rest of world	0.02	0.13

*C. Birth period*

Born 1800–1849	0.34	0.47
Born 1850–1899	0.58	0.49
Born 1900–1949	0.08	0.27

*D. Total works per annum*

Output	0.73	1.08
E. Wars experienced		
Any war (years)	9.38	6.46

*Sources* Data on composers are obtained from Grove Music Online (2009). Number of important compositions is taken from Gilder and Port (1978). War data are employed from the Correlates of War data set (Sarkees 2000)

The *British Isles* include composers from England, Scotland, Ireland and Wales. *Eastern Europe* relates to composers born in any of the Eastern Europe countries as classified by United Nations Statistical Division, with the exclusion of Russia. The *Germanic Countries* relate to the three German-speaking countries of Germany, Austria and Switzerland. *Rest of Europe* covers composers from all other European countries. *Rest of World* relates to composers that do not fit in any of the other categories

Germany, Austria and Switzerland) accounted for the highest share of births of important composers—approximately 20 % each, followed by Russia with 14 % of births, Italy and Eastern European countries each with around 10 % of births.<sup>10</sup> One-third of the composers were born in the first half of the nineteenth century, around 58 % were born in the second part of the 19<sup>th</sup> century, and the remaining artists were born in the early twentieth century. On average, the total yearly output is equal to 0.73 and suggests that an artist during his career was composing two major classical works in less than 3 years. In Table 2, we summarise composers' annual creative production outcomes, measured as the number of written works, for years of peace as well as for the periods when war lasted. It can be observed that while productivity in the absence of any war is equal to around 0.74 works, it drops to 0.69 works if

<sup>10</sup> See Table 1 for details on grouping of countries.

	(1) Observations	(2) Total compositions per annum
Peace	4,213	0.739 (1.085)
Wartime	1,040	0.696 (0.324)
Difference (Wartime–lifetime)		−0.044 (0.037)

Sources See Table 1

war occurs. The difference is statistically insignificant but only marginally outside the usual confidence intervals ( $p$  value equal to 0.12). We find here a first indication of the existence of differences in artistic production depending on the presence of peace or war.

## 4.2 Model specification

The aim of the econometric analysis is to estimate the impact of war on composers' productivity. Formally, the specification is given by:

$$\text{Composition}_{it} = \beta_1 + \beta_2 \text{War}_{it} + \beta_3 \text{YearFE}_t + \beta_4 \text{AgeFE}_i + \beta_5 \text{ComposerFE}_i + \beta_6 \text{CountryFE}_i + \varepsilon_{it},$$

where  $\text{Composition}_{it}$  denotes the number of important works written by composer  $i$  in year  $t$  and  $\text{War}_{it}$  is an indicator function that is equal to one for war that occurred in the country of residence of composer  $i$  in year  $t$ , and zero otherwise. Furthermore, the specification contains a set of control variables. The estimated equation contains a set of year dummies to deal with inter-temporal differences in composers' productivity levels. The indicator functions for time take the value one for each year and zero otherwise. In order to account for varying productivity levels over a composer's lifetime, we include a quadratic age polynomial (i.e.  $\text{Age}_{it}$  and  $\text{Age}_{it}^2$ ). The quadratic term allows for decreasing productivity levels at higher ages. Taking account of unobserved heterogeneity of composers, we include indicator functions for each composer. Those control variables are intended to deal with productivity differences between different composers. We further control for country level factors that affect composers' productivity and are constant over time by including a full set of country fixed effects. In some specifications reported below, we account also for composers' location by including a set of dummy variables for each location visited. The effect of the war is likely to be correlated within a country; therefore, we account for any dependence between observations within composers located in a country by clustering the error terms at the country level.<sup>11</sup>

<sup>11</sup> If error terms were not clustered, the coefficients would be estimated with somewhat higher precision. In order to enhance the reliability of the findings, we report only the preferred specifications with error terms clustered at country level.

	(1)	(2)	(3)	(4)
	OLS	OLS	OLS	OLS
War	-0.128** (0.0579)	-0.110* (0.0566)	-0.0943* (0.0482)	-0.115** (0.0501)
Year controls	Yes	Yes	Yes	Yes
Age controls		Yes	Yes	Yes
Composer controls			Yes	Yes
Country controls				Yes
Observations	5,253	5,253	5,253	5,253
$R^2$	0.044	0.076	0.291	0.297

Standard errors are clustered at the country level and reported in parentheses. All specifications contain a constant term and are estimated with ordinary least squares

\*\*\*, \*\*, \* Estimates that are significantly different from zero at 99/95/90 % confidence levels

The main coefficient of interest is  $\beta_2$ , indicating how the incidence of war affects composers' productivity. The direction of a relationship between war and productivity, if any, seems to be clear. War may impact an individual's productivity: there is hardly any reason why a composer's annual productivity would affect the incidence of war.

### 4.3 Econometric estimates

Estimations based on the model above are presented in Columns 1–4 of Table 3. In the first column, we report a specification that contains only year fixed effects, and we then add age fixed effects in Column 2, composer fixed effects in Column 3 and country fixed effects in Column 4. The point estimates in all four specifications indicate a negative association between the incidence of war and creative production. In the preferred specification with a full set of control variables, the relationship is significant at the 5 % level and implies that the incidence of war is associated with an annual decrease in composers' productivity of around 0.11 works. Given composers' average productivity of around 0.73 works per annum (see Table 1), the results imply a productivity decrease of 15 %.

We have also conducted a number of robustness tests—as can be viewed in Table 4—that suggest the results are consistent. First, we included a set of control variables that account for the exact location where a composer was present in a given year (e.g. Paris). In some cases, the exact location is, however, not known and only the country is given. Furthermore, a reliable estimation would not be possible if indicator functions for each observed location were included as their number is simply too great. Therefore, we included a large set of dummy variables accounting for the thirty most important cities and have recorded the locations of minor

	(1) OLS full sample	(2) OLS full sample	(3) OLS restricted sample	(4) OLS restricted sample	(5) Negative binomial full sample
War	-0.115** (0.0501)	-0.126** (0.0489)	-0.159*** (0.0549)	-0.145** (0.0652)	-0.145** (0.0652)
Year controls	Yes	Yes	Yes	Yes	Yes
Age controls	Yes	Yes	Yes	Yes	Yes
Composer controls	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes
Location controls		Yes			
Observations	5,253	5,253	4,310	3,972	5,253
R <sup>2</sup>	0.297	0.310	0.268	0.180	N/A

Standard errors are clustered at the country level and reported in parentheses. Column 3 reports a specification which excludes composers who experienced less than 2 years of war or produced less than ten works. Column 4 presents a specification which excludes most productive 25 % of composers. All specifications contain a constant and are estimated with ordinary least squares, except the specification in Column 5, which is estimated with a negative binomial regression model

\*\*\*, \*\*, \* Estimates that are significantly different from zero at 99/95/90 % confidence levels

importance or which are unknown as the rest of a country (e.g. Rest of France).<sup>12</sup> Despite this approximation, the estimation contains a set of meaningful controls for important cities and hence to some extent accounts for the specific local demand and cultural infrastructure that in turn could determine composers' productivity. The regression results are presented in Column 2. In accordance with the baseline specification, which is reported in Column 1, the point estimate implies a strong, negative and significant impact of war on composers' productivity.

Some composers have composed very little or have experienced almost no war during their lifetime. It is unlikely that individuals with very few positive observations lead to any spurious results, as we have already included composer fixed effects which should prevent any such bias. Nonetheless, we investigate this possibility and exclude composers who experienced less than two years of war or composed less than ten works during their life. The war coefficient for the restricted sample is reported in Column 3: the point estimate remains consistent with the baseline specification.

<sup>12</sup> The specific local demand and cultural infrastructure could lead, for example, to the composition of predominantly chamber works in Vienna, concert works in London or theatre works in Italian cities. Note that composers also often specialised in a certain type of composition (e.g. Georges Bizet in opera works), hence including composer fixed effects already takes account to some extent of the heterogeneity of compositions.

composers and if the most productive artists experienced more wars than the average creative individual. We investigate also this possibility and drop the most productive quartile of composers. The coefficient on the war variable is now somewhat smaller in size, nonetheless negative and significant thus providing support for the main results.

Finally, one might worry that ordinary least squares estimation techniques might lead to some bias, as the dependent variable takes only non-negative integer values. For this reason, we estimate an additional regression employing a negative binomial model. The results are reported in Column 4. It can be observed that the war impact remains once again unchanged.

## 5 Conclusion

The findings of this short study are quite conclusive. War, perhaps not unexpectedly, impacts negatively on individual life-cycle creative output, despite some claims to the contrary. Perhaps the negative impact is not as large as one might expect though, thereby lending credence to the theories that link the stress and trauma of events such as war to an enhanced creative output.

As mentioned previously, the study was limited by the data available, not just on the locations of the composers for each year of their lives but also by data on creative output and wars. The sample of composers looked at then was 115, a quite sizeable number nonetheless for work of this nature.

The biggest qualification must attach to the measure of creative output. Only ‘important’ works (as judged by the experts) were included, but these cover many different forms of music and all were amalgamated into a single number.<sup>13</sup> Is for example one important symphony comparable to one important piano sonata or an opera or a church choral work? We attempted to check for this by including additional control variables, such as location fixed effects. Another difficulty was that some composers had only a small number of important works over their life time, and hence, it might be argued, any comparison between war and non-war years is limited. Again, we tried to address this by omitting composers with less than 10, 20 and 30 important works and the impact of war was the same, suggesting that yet again the results are robust to various specifications.

**Acknowledgments** The authors would like to thank five anonymous referees for helpful comments, three of them on an earlier and very different version of this paper.

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<sup>13</sup> There is no distinction made either between ‘important’ and ‘masterpiece’ but even if there was how would these be weighted?

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