Location effects in literature: Evidence on peer quantity, quality, and productivity channels

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Abstract

This paper provides evidence of potential channels through which these location effects occur in the context of literary production. In particular, this paper determines whether location effects occur through a quality channel, a quantity channel, or a productivity channel. This study utilises a unique dataset with information on 369 prominent authors in the UK and Ireland born 1700–1925. This paper constructs age-productivity profiles to determine the productivity gains associated with the characteristics of co-located authors. Individual fixed effects are used to control for spatial and group sorting. Evidence suggests location effects occur primarily through quality and productivity channels and that these effects occur through the general clustering of authors and not through co-located social connections. There is also evidence that authors benefit most from location effects when they are under the age of 40 and thus in the early stages of their career.

Keywords: Economic geography, geographic concentration, peer effects, cities, productivity, urban history, literary artists

JEL Classifications: J24, J61, N30, N90, R19, Z11

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1 Introduction

In 1897, a young Thoby Stephen began his university studies at King's College, Cambridge. He became friends with a number of the members of the semi-secret university club *the Apostles*, including John Maynard Keynes, Lytton Strachey, Leonard Woolf, Clive Bell, and E.M Forster. Thoby introduced this group to his sisters, Virginia Stephen (later Virginia Woolf) and Vanessa Stephen (later Vanessa Bell) who were living in London at the time. After graduating, many of these *Apostles* moved to the Bloomsbury district of London, where they met regularly and developed their careers as prominent writers, artists, and intellectuals.[1] A natural question arises: would this *Bloomsbury Group* have been so successful if they had not lived in London? Was their success due to spillovers within their highly localised social group? Or, was their success due to the wider agglomeration of creatives and related cultural infrastructure in London?

This paper aims to understand of the channels through which location effects in literature occur. Until now, there have been major limitations to research on such effects in innovative and creative industries. As Crescenzi et al. (2016) note "we still know relatively little about *individual innovative agents* - most studies aggregate outcomes to firms, cities and regions...[D]ue to data constraints, there are few studies that have been able to explore time periods above a decade" (p. 179). To overcome these challenges, I exploit a novel panel dataset on 369 historical authors from the UK and Ireland born 1700-1925 to empirically test whether location effects occur through a quality channel (the quality of co-located authors), a quantity channel (the number of co-located authors), or a productivity channel (the output of co-located authors). I also use data on author social connections to disentangle the effects of co-located social connections and the effects of other authors living in the same city.

There is a growing body of evidence of the influence of location and social groups on career success in a variety of creative industries. Azoulay et al. (2010) find evidence of positive spillovers between academic 'superstars' and their collaborators. Similarly, Kim et al. (2009) find positive spillovers between colleagues in economic and finance departments in elite universities. Waldinger (2010) and Waldinger (2012) both utilise the dismissal of Jewish academic in Germany during World War II as an exogenous shock to investigate peer effects. Waldinger (2010) finds faculty quality has a positive effect on PhD student outcomes, while Waldinger (2012)

[1] See the *Bloomsbury Group* entry in Encyclopaedia Britannica (2014).

find evidence of positive peer effects for co-authors. Hellmanzik (2016) finds that artists who live work dense high-quality peer groups, such as Paris, produce systematically higher priced paintings. Hodgson and Hellmanzik (2019) determine that association with artistic movements impacts the career dynamics of an artist.

There are a number of other mechanisms that could play a role in the London effect in literature observed in Mitchell (2019). The agglomeration of an industry and localised social interactions may impact behaviour and productivity through a variety of mechanisms, including facilitating the flow of information, influencing tastes and preferences, or providing risk-sharing devices.[2] As Mitchell (2019) notes,"the agglomeration of literature and related cultural industries would increase the probability of attaining high-quality matches across social and professional networks, including publishers, editors, literary critics, intellectuals and others who were prominent or influential in British and Irish society" (p. 18). Helsley and Strange (2002) also suggest that input sharing not only assists in the generation of new ideas but also reduces the costs of realising ideas.

In sum, this paper explores the 'black box' of agglomeration effects for authors by exploring the mechanisms that underlie the agglomeration gains observed in Mitchell (2019). I find evidence that the quality of co-located authors has a negative effect on productivity and that this effect is primarily driven by the general clustering of authors and not through co-located social connections. This negative quality channel is only observed during periods when authors live in London, which is consistent with the findings of Mitchell (2019). During periods when an author lives in London, the productivity of other authors also has a positive effect on own-productivity, suggesting that general market conditions play a more important role than pressures or spillovers from social connections. There is also evidence that authors benefit most from location effects when they are under the age of 40 and thus in the early stages of their career.

The remainder of this paper is structured as follows. In the next section, I describe the data and provide summary statistics. Section 3 outlines the identification strategy. The results are presented in Section 4. Section 5 concludes.

[2]See, for example, Granovetter (1973); Storper and Venables (2004); Breschi and Lenzi (2016); Lobo and Strumsky (2008); Ter Wal and Boschma (2009); Topa and Zenou (2015); Agrawal et al. (2006); D'Este et al. (2013); Singh (2005), among others.

2 The data

2.1 Construction of the dataset

This paper combines the Mitchell (2019) dataset containing location and biographical data on 369 prominent authors (born 1700-1925) with new data on social connections. Table 1 includes a list of authors included in this study. This purpose-built dataset was constructed by manually transcribing unstructured information from encyclopaedia entries to a structured environment.[3,4] These data include age, number of publications per annum, and location for every year of the author's life. I limit the study to authors' prime working ages defined as age 18 to 65. The sample used in the analysis begins in 1725 and ends in 1975.

This dataset also include a measure of author quality, defined as the total word count of the entries dedicated to the respective authors in the following online encyclopaedias: Encyclopaedia Britannica (2014); The Literary Encyclopaedia (2014); and Literature Online (2014). This quality measure is modern derivation of the column-inch method used by O'Hagan and Kelly (2005) and Hellmanzik (2010), among others. With the column-inch method, an artist's prominence is determined by the amount of space (in terms of columns and inches) dedicated to that author in hard copies of dictionaries and encyclopaedias. This method was commonly used before these reference materials were digitised and thus automatically extracting the word count was not possible. The three encyclopaedias used in this study were available online, thus allowing for a more precise measure of the amount of critical attention each author receives.[5]

The new data includes a list of the social connections of authors in the dataset. The data on author social connections were collected from the three original sources (Encyclopaedia

[3]Celtic literature includes literature associated with Celtic nations within the British Isles (Ireland, Scotland, Isle of Man, Wales, and Cornwall) and does not strictly refer to literature written in the Celtic languages.

[4]Authors are defined as individuals who made at least one unique contribution to poetry or prose, which eliminated individuals whose contributions were strictly limited to translations, textbooks, manuals or guides, song-writing, literary criticism, or publishing.

[5]In a personal correspondence with J.E. Luebering (Encyclopaedia Britannica Executive Direct, Core Editorial) and Adam Augustyn (Encyclopaedia Britannica Managing Editor) on 27 August 2019, I confirmed that the column-inch method and word count method were, historically, reasonably good reflections of the contemporaneous significance of a person (artist, author or otherwise). There were physical constraints to the traditional printed encyclopaedia sets, and so the editorial board had to determine both who should be included in the encyclopaedia and how much space should be devoted to that person in each edition. They believe this is still broadly the case now; however, they note that the digitisation of encyclopaedias and the low cost of digital storage has relaxed these constraints. They do provide word count targets when they commission articles, but they noted that they would not reduce the length of an article if an expert contributor went beyond the target word count.

Britannica, 2014; The Literary Encyclopaedia, 2014; and Literature Online, 2014) in a separate data collection process. All social connections mentioned in an authors' biographical entries were recorded. While other important figures were listed in the biographies, the social connections in this study are limited to other authors in the existing dataset. This allows me to identify the years when an author and her social connections were co-located.

It is important to emphasise that authors likely had more actual social connections than those included in the dataset, and thus the list of social connections is not a comprehensive list of all individuals an author met or interacted with. Rather, the list includes individuals such as friends, family, professional contacts, important rivals, etc. who played an important role in an author's personal life, professional life, or both. The experts chosen to write the biographies are selected because of their specialised knowledge on the respective author, I rely on their expertise to determine which connections are important enough to merit mention in a biography.[6] I argue that this data limitation is a reasonable one. Not all social connections would have an impact on an author's writing process or access to important literary actors, and those who were vital to an author would be worth mentioning.

Evidence suggests that not all relationships are of equal importance. Agrawal et al. (2006) make an important distinction between within-field relationships (inventors working in the same technological field) and across-field relationships (inventors working in different technological fields). They hypothesise that information may be more easily exchanged in within-field relationships irrespective of location and that "knowledge from outside their 'community of practice' may be harder to come by outside of social relationships facilitated by co-location" (p. 8). Their findings support this hypothesis. Azoulay et al. (2010) finds that spillovers in contemporary academic science co-author networks are more likely to occur between individuals in 'idea space' than in 'physical space' or 'social space.' This suggests that physical proximity and social interaction are not sufficient conditions for knowledge spillovers for academic scientists and that spillovers can only occur between academics who work within the same boundaries within a scientific field.

[6] In my 27 August 2019 personal correspondence with J.E. Luebering (EB Executive Director, Core Editorial), I asked about their editorial process, how the editorial team decide who to include in the encyclopaedia, and who writes the encyclopaedia entries. They noted that the articles are written by commissioned experts and staff contributors. Each article includes a list of article contributors and their qualifications, as well as an article history detailing the changes made to the article since it was digitised.

This is likely to hold true for historical literary production as well. Given the historical limitations in travel and communication technology, physical proximity to specific social connections is likely to play an important role in productivity before the rise of high-speed rail networks and the widespread adoption of other technologies, such as the automobile and telephone. In this context, geographic co-location of social connections is likely to play an important role in literary production in addition to the economies of scale effects from the geographic concentration of authors in general or agglomeration of the publishing and book selling industries. In particular, social relationships may facilitate knowledge spillovers through three possible mechanisms:

> "First, once a relationship is established, it may actually be pleasurable for the parties to exchange information about their work. Second, even where the information exchange is costly, the establishment of a long-term relationship may allow for the development of trust that facilitates reciprocal knowledge transfer. Third, where inventors care about the opinions their colleagues hold about their work and their willingness to cooperate, the development of social relationships may contribute to social pressures to reveal (at least) the non-rivalrous part of what they know." (Agrawal et al., 2006, p. 4)

Indeed, there is anecdotal evidence of this in authors' correspondences and other historical records. For example, J.R.R. Tolkien and C.S. Lewis were members of an informal collaborative group of Oxford-based writers known as *the Inklings* who met regularly through the 1930s and 1940s. The group began with casual meetings between Tolkien, C.S. Lewis and Owen Barfield, during which they discussed politics and philosophy. The group slowly expanded to include other writers, and eventually – and perhaps most influentially – they began to discuss their own unfinished works. Encyclopaedia Britannica (2014) notes that:

> "The group contributed significantly to its members' success through its criticism, support, and encouragement, an indebtedness evident in the acknowledgment pages and dedication pages of many of their works: Lewis's *The Problem of Pain*, Williams's *The Forgiveness of Sins*, and the first edition of Tolkien's *The Lord of the Rings* were dedicated to the Inklings. Lewis wrote of the Inklings, "What I owe to them all is incalculable," and Tolkien noted that "only by [Lewis's] support and friendship did I ever struggle to the end" of *The Lord of the Rings*."[7]

[7]See Encyclopaedia Britannica (2014) entry on *The Inklings*

Thus, there is evidence that the co-location of authors enabled collaborations that resulted in knowledge being shared within social groups.

While both J.R.R. Tolkien certainly had contact with many other people throughout his life, it is reasonable to assume that spillovers between authors are most likely to occur within literary circles rather than among all people they ever had contact with. It is important to note, though, that collaborations in literature typically do not result in co-authored works, unlike collaborations among innovators and academics which often result in collaborative works such as co-patents and co-authored research papers. The only quantifiable outcome of such literary collaborations is any resulting increase in individual productivity or quality of works being produced.

There may be concern that authors born outside the UK and Ireland may be systematically disadvantaged in establishing social connections with other authors in the network.[8] However, all such individuals successfully integrated into British society. There is no evidence to suggest that being born abroad or being an immigrant systematically disadvantaged any of the authors.[9]

[8]The locations elsewhere in the world primarily consist of parts of the British Empire: India (6), Australia (1), Burma – now Myanmar (1), New Zealand (2), South Africa (1), and Southern Rhodesia – now Zimbabwe (1). Others were born to British parents living abroad but outside the British Empire who often returned to the British Isles at relatively young ages. There are some notable exceptions.

[9]For example, Wyndham Lewis was born to a British father and an American mother. Though he was born on his father's yacht off the coast of Canada, his parents subsequently returned to England. W.H. Hudson's parents were Americans (of British and Irish origin). While Hudson was born in Buenos Aires, he moved to England at age 28. Hudson became a naturalised British citizen in 1900. T.S. Eliot was born in Missouri, USA to American parents. Eliot moved to England at age 25, became a naturalised British citizen, and renounced his US citizenship. Encyclopaedia Britannica (2014) entries on *Wyndham Lewis, W.H. Hudson, and T.S. Eliot* for more information.

Similarly, Jennie Jerome Churchill was born in New York, USA to American parents. Churchill moved to Paris at age 13 and never lived in the US again. She married Lord Randolph Churchill at age 20 and became a well-known British socialite. Churchill is also famously the mother of Sir Winston Churchill (the former Prime Minister of the UK), who is also an author included in this dataset. Although he is more famous as a politician and non-fiction writings, Sir Winston Churchill also wrote a novel, a short-story, and poetry. See Encyclopaedia Britannica (2014) entries on *Jennie Jerome Churchill and Winston Churchill* for more information.

Joseph Conrad is notable as the only author who was not a native English speaker. Joseph Conrad was born in Ukraine to Polish parents. Conrad first travelled to England in 1878 after serving on a British freighter. At the time, he had very limited knowledge of the English language (though his literary works were written almost exclusively in English). He eventually settled in England and was naturalised in 1886. Despite the language disadvantage, Conrad is recognised as "a writer of complex skill and striking insight, but above all of an intensely personal vision, he has been increasingly regarded as one of the greatest English novelists" (*Joseph Conrad*, Encyclopaedia Britannica, 2014.)

2.2 Summary statistics

Summary statistics for the whole sample are presented in the first column of Table 2. The evolution of these statistics over time is presented in the next five columns, each column includes statistics for a 25 year period. Since Mitchell (2019) observed that London was the only major literary cluster from 1700-1999, the same summary statistics for London-based authors are presented in Table 4. The author population peaks during the 1875-1924 period, with around 52% of authors living during this period. The mean age at publication is increasing over time. Author quality remains relatively stable for most of the sample, with authors in the last 50 years having 2000-3000 more words per entry than those in the previous periods. The characteristics authors who live in London are broadly similar to the overall population.

The trends in author population over time are illustrated in more detail in 1. As with the overall sample, the population living in London begins to wane in the 20th century. However, while the total author population peaks after 1925, the author population living in London peaks around 1900. Author quality also peaks around the same time, both for the overall sample and for authors living in London, as illustrated in 2. However, the relationship between author quality and the number of authors living in London does not appear to be very strong.

Table 4 includes summary statistics on the clusters (any city where at least two authors are co-located). All means are defined as leave-out means, i.e., the means are calculated for all co-located authors excluding own-author values. The average cluster size is 30 authors, while the average size of the London cluster is 43 authors. Overall, co-located authors produce around one work every 21.5 months (or 0.56 works per year). Authors located in the London cluster produce closer to one work every 20 months (or 0.6 works per year). The overall author quality is similar to that of London-based authors (around 4100 words total). However, the variance in quality is much lower for the London cluster. On average, authors live in the same city as 1 social connection or, when living with London, 2 social connections. An author's social connections tend to produce less than others living in the same city, and they are of slightly lower quality as indicated by the lower mean word count.

As illustrated in Figure 3, the average authors tends to live in the larger clusters between ages 20 and 45. The life-cycle trend in co-location with social connections is similar, with the mean

number of co-located social connections peaking from around ages 25-45. Overall, author output tends to follow a similar pattern, peaking during the period when she lives in the largest cluster. However, unlike mean cluster size, productivity does not decline after age 45. This suggests that location effects could have a greater influence on productivity when authors are younger and are thus in the earlier stages of their career. There is a similar trend for co-locating with social connections. However, the mean number of co-located social connections peaks at an earlier point in the author's life-cycle compared to general cluster size.

3 Identification strategy

I broadly follow the Borowiecki (2015) approach but extend the analysis by including the mean output of co-located authors in addition to the number and quality of co-located authors. More specifically, I begin by estimating the effect of mean characteristics of co-located authors with the following equation:

$$Output_{ict} = \alpha + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \lambda \left(\frac{1}{n_{ct-1}} \sum_{j=1, j\neq i}^{n_{ct-1}} Output_{jct-1} \right) + \delta \left(\frac{1}{n_{ct}} \sum_{j=1, j\neq i}^{n_{ct}} Quality_{jct} \right) + \theta(n_{ct} - 1) + \mu_i + \gamma_t + \epsilon_{ict} \quad (1)$$

in which output of individual i in city c at time t is a function of own-age (quadratic terms allow for non-linear own-age effects), the mean output of authors in city c at time t-1 excluding own-output, the mean quality of authors in city c at time t excluding own-quality, and the number of authors in city c at time t excluding author i.[10] As authors co-locate, or geographically cluster, at the city-level, I will refer to these as cluster variables in the following sections.

[10]It is important to note that the output indicates when a work was published but not when that work was written. This measurement error is not unique to this study. The same problem is encountered in studies of scientific production or invention, as it is only possible to know when an academic article was published or when a patent was registered but not when the actual idea occurred. For example, Hanlon (2015) finds evidence of an rapid increase in patents improving technologies related to the lower-quality Indian cotton after a blockade on Southern shipping during the US Civil War increased the cost of higher-quality cotton from the US South. Given that the patents relating Indian cotton increased so quickly after the blockade occurred, it is likely that the inventions had been made prior to the blockade and that the political circumstances simply made them more profitable and thus worth registering.

Because few authors co-locate in cities outside of London, I repeat the estimation with a specification using a London fixed effect and again with London interaction terms to identify the channels through which the London location effect may work, which may differ from those associated with other, less populated locations. When authors live alone, all cluster variables (output, quality, and quantity of authors) are equal to zero.

In a second step, I re-estimate this equation with regressors for the output, quality, and quantity of co-located social connections (*social*) and other co-located authors (*other*). Evidence presented in Mitchell (2019) suggests that the spatial concentration of authors reflects the spatial concentration of the publishing and book selling industries. Thus, simultaneously estimating the effect of the characteristics of co-located authors who *are* social connections and those who *are not* social connections allows me to to determine whether cluster effects occur primarily through social channels (for example, via knowledge spillovers within their social networks) or through other agglomeration effects associated with the concentration of authors and other inputs related to the publishing and book selling industries.

Finally, I re-estimate this final specification for the period of an author's life-cycle when she is under the age of 40 and again for the period when she is aged 40 and above (age 40 is roughly the mid-point of the career). As discussed previously, the trends illustrated in Figure 3 provide preliminary evidence that location effects are not constant over the life-cycle. This final analysis allows me to determine if the mechanisms through which location effects occur have a greater impact on productivity when she is younger and thus in an early stage of her career.

There are a number of challenges in identifying a causal effect. As Bramoullé et al. (2009) note, "simultaneity in behaviour of interacting agents introduces a perfect collinearity between the expected mean outcome of the group and its mean characteristics," making it difficult to separately identify endogenous peer behaviour from the exogenous peer characteristics and correlated effects (then tendency of individuals to act similarly because they face the same environment).[11] In the context of this paper, does an author produce more because she lives in the same city as highly productive authors – or do authors in the same city produce more because she is more productive? Do authors self-select into groups of similar individuals and

[11] See Manski (2000), Bramoullé et al. (2009), Angrist (2014), Durlauf (2004), Durlauf and Ioannides (2010), Lee (2007), Topa and Zenou (2015), and Davezies et al. (2009) for further discussion of the identification of peer and neighbourhood effects.

thus display similar outcomes purely because they share similar characteristics? Is author productivity simply a reflection of local environment – location, time, literary trends, technological constraints, etc.?

The use of leave-out means (the cluster mean excluding one's own-observation) partially alleviates the *endogenous* reverse-causality issue but does not eliminate it. For example, the individual author plays a diminishing role in determining other authors' productivity as the size of the local population grows; however, the productivity of all authors is likely to increase as the local population grows.[12] The use of lags will also address this issue of reverse causality: past cluster output impacts current own-output, while current own-output cannot impact past cluster output. Therefore, I utilise leave-out means for all cluster variables and one-year lags for mean cluster output. I control for correlated effects by using time fixed effects.

Estimation is complicated by sorting on unobservables or social interactions. For example, if individuals sort on positive interactions, the estimated effect of peer output will be an overestimate of the true effect and vice versa for sorting on negative interactions (Glaeser et al., 2002). Authors are likely to self-select into location and self-select into groups. To deal with this *reflection problem*, Bramoullé et al. (2009) suggests using 'friend-of-friend' characteristics to instrument for friend characteristics. This method requires a sufficient number of intransitive triads (author A is friends with authors B and C, but author B and author C are not connected to once another except indirectly through author A). Unfortunately, this approach is not possible given the level of transitivity of the author network.

As an alternative approach, I utilise author fixed effects in order to control for individual self-selection that does not vary over time. I use 5-year time dummies to control for changes over time while also avoiding the age-cohort-time problem that could arise with the linear combination of age, year dummies and individual fixed effects.

[12] See Bramoullé et al., 2009.

4 Results

4.1 Overall cluster effects

The coefficients for the estimates overall cluster effects (estimation of Equation 1 above) are presented Table 5. In all models, the regressions are estimated with age-quadratic terms, a constant term, author fixed effects, and 5-year time dummies. Robust standard errors are clustered on the individual level to account for serial correlation within individuals. Column (1) shows the coefficients for a standard age-productivity profile with the cluster quality, cluster size, and cluster output$_{t-1}$. Column (2) introduces a London indicator equal to 1 if an author is residing in London in time t and equal to 0 otherwise. Column (3) adds London interaction terms.

The estimates in Columns (1) indicate the importance of the quantity channel in location effects: the total number of co-located authors positively impacts own-productivity. However, there is no statistically significant impact of the quantity channel beyond the London fixed effect, as evidenced by the estimates in Columns (2) and (). This suggests that the number of co-located authors has a causal impact on productivity in that it captures whether an author is living in London. As evidenced in Column (3), living in London has a positive impact on own-productivity, but the clustering intensity of authors in London does not. The size of all other clusters has no statistically significant impact on own-productivity. This quantity effect is likely due to benefits associated with the agglomeration of unobserved related industries in London, such as the book publishers and book sellers, that are captured by the London fixed effect.[13]

As seen in Column (3), cluster quality has a negative impact on own-productivity during the periods of an author's life when she is living in London. In particular, a one standard deviation increase in the mean quality of authors in the cluster reduces own-productivity by 0.46 works per annum or around one work every 26 months. Cluster quality does not have a statistically significant effect on own-productivity when the author lives elsewhere. Given that it is improb-

[13]It is important to note Mitchell (2019) found evidence of negative selection to London with respect to output – that is, less productive authors were more likely to migrate to London. Therefore, this London fixed effect is not driven by the inward migration of highly productive authors.

able that knowledge spillovers would make one worse off, it is likely that this instead reflects competition on quality. Publishers had limited physical capacity for producing books, so this result suggests that publishers were able to identify and prioritise high-quality authors, resulting in a 'crowding out' effect.

This finding is contrary to that of Hellmanzik (2010), which found that the mean quality (given by the average column-inches) of visual artists living in Paris or London at the time an artwork was produced positively impacts the auction sale price of that work. However, Hellmanzik (2010) does not examine whether location effects impact the rate of artistic production. The difference in outcome variables is an important one. It is likely that location effects impact the quality of works produced by both artists and authors, even if location effects do not impact the quantity of works being produced. It is also possible that a quality-quantity trade-off exists in literary production. Any changes in quality would be reflected in the auction prices of artworks, but they are not likely to be reflected to the same extent (if at all) in the sale price of books. Unfortunately, data on book sale prices or other quality measures, such as word count of book reviews or the number of copies produced in print runs, is not available, so it is not possible to explore this dimension.

4.2 Decomposed cluster effects: Social connections vs others

In order to determine whether the overall cluster effects are driven by the co-location of social connections or by the general clustering of other authors living in the same city, I re-estimate the specification in Column (2) of Table 5 with decomposed cluster variables. These estimates are reported in Table 7. Columns (1), (2), and (3) separately identify the quantify, quality, and output channels, respectively. The estimates when all channels are simultaneously estimated are provided in Column (4). Column (5) repeats the estimated of the previous column with the addition of a London fixed effect. The quantity effect observed in the previous results is not driven by social connections but rather the general agglomeration of other authors in a city. The decomposed quantity effect disappears with the introduction of a London fixed effect, as seen in the overall cluster effect.

As the location effects appear to be specific to the London cluster, I re-estimate the specification in Column (3) 5 with both decomposed cluster variables and London interaction terms. The

estimates are included in Table 7. As in the previous table, Columns (1), (2), and (3) separately identify the quantify, quality, and output channels, respectively. The estimates when all channels are simultaneously estimated are provided in Column (4). Consistent with the findings in Column (3) 5, cluster quality has a negative impact on own-productivity during the periods of an author's life when she is living in London. The mean quality of social connections has no statistically significant impact on own-productivity. The entire quality channel is driven by other co-located authors, further suggesting that authors are being 'crowded out' by higher quality authors in general but are not directly competing against their social connections.

The results in Column (4) also indicate a positive productivity effect for the periods when an author lives in London. This productivity effect is not due to the productivity of social connections but rather the productivity of other co-located authors. This could indicate that authors feel pressured to compete for the attention of readers or to stay relevant in an increasingly saturated book market. This could also reflect other agglomeration mechanisms, such as input sharing, or general market conditions in London. For example, an increase in the capacity constraints of publishers or an increase in the general demand for books would increase the ability of all authors getting a work published. Information on publishing houses and book markets would be valuable for investigating this mechanisms in greater detail.

As mentioned previously, the output measure does not reflect the quality of the work. This could explain why social connections do not seem to have statistically significant location effects. It is likely that knowledge spillovers helped authors realise their ideas; social connections may help authors learn how to turn an idea into a written product in processes similar to that of *the Inklings* described above. These spillovers would positively affect the quality of works but not necessarily the quantity of works. Given that the output measure does not reflect the *quality* of an individual work, this potential mechanism cannot be confirmed. The definition of output is an important limitation, and future studies on the productivity of creative workers should consider the potential importance of quality of output in their design. Social connections also could have served as important links to the publishing industry. In this case, it is not the productivity, quality, or quantity of social connections that matters but rather the role of social connections have as gatekeepers to a wider network of people in the creative industries.

4.3 Early career vs late career effects

I re-estimate the specification in Column (4) of Table 7 for the period of an author's life-cycle when she is under the age of 40 and for the period when she is aged 40 and above (in Column (2)). These estimates are provided in Columns (1) and (2) of Table 8, respectively. Consistent with the previous findings, the output of other authors in London has a positive impact on own-productivity, while the quality of other authors in London has a negative impact on own-productivity. These results confirm that the location effects benefit younger authors but have no statistically significant effect on author productivity once authors are older and thus in later stages of their career.

The finding with respect to other quality suggests that younger and less experienced authors are likely to suffer from being 'crowded out' by higher quality authors and that once an author is older, more experienced, and more established in the literary community, she does not experience this 'crowding out' effect. It is possible that authors spend the first part of their career establishing critical relationships with the wider printing and book selling community. Once these relationships are established, the author does not have to compete with others on quality.

The finding with respect to output could indicate that authors develop a dedicated readership and are therefore less driven by the need to compete for readership. It is also possible that older, established authors have other careers (e.g., university lecturer positions) or other income supports (e.g., awards and fellowships). Therefore, the stability of their income and thus their drive to publish is not as subject to contemporary market pressures.

5 Conclusion

This paper studied the channels through which location effects in literature occur by empirically testing whether location effects occur through a quality channel (the quality of co-located authors), a quantity channel (the number of co-located authors), or a productivity channel (the output of co-located authors). the effects of co-located social connections and the effects of other authors living in the same city. This analysis also determined whether these location effects are driven by characteristics of co-located social connections and of other authors living

in the same city.

This analysis used a novel panel dataset on 369 historical authors from the UK and Ireland born between 1700 and 1925 and combines annual location information, annual publications, and known social connections between authors. I construct age-productivity profiles to determine the annual productivity gains associated with the mean quality of co-located authors, mean output of co-located authors, and number of co-located authors. Individual fixed effects are used to control for spatial and group sorting.

The results provide evidence for the quantity channel in location effects: the total number of co-located authors positively impacts own-productivity. However, there is no statistically significant impact of the quantity channel beyond the London fixed effect, suggesting that the number of co-located authors is important insofar as it reflects whether an author is living in London. However, the clustering intensity of authors in London does not have a causal impact on productivity. This quantity effect is likely due to benefits associated with the agglomeration of unobserved related industries in London, such as the book publishers and book sellers, that are captured by the London fixed effect.[14]

Cluster quality has a negative impact on own-productivity during the periods of an author's life when she is living in London. This effect is not driven by competition from co-located social connections but rather the co-location of other authors. Given that knowledge spillovers are unlikely to make an author worse off, it is likely that this reflects competition on quality. Publishers had limited physical capacity for producing books, so this result suggests that publishers were able to identify and prioritise high-quality authors, resulting in a 'crowding out' effect. This 'crowding out' effect is only observed during the first half of an authors career (under age 40). There are a number of possible explanations for this findings. It is possible that authors spend the first part of their career establishing critical relationships with the wider printing and book selling community. Once these relationships are established, the author does not have to compete with others on quality.

The output of other authors in London has a positive impact on own-productivity – an effect that is also only observed during the first half of an authors career. It is also possible that

[14]It is important to note Mitchell (2019) found evidence of negative selection to London with respect to output – that is, less productive authors were more likely to migrate to London. Therefore, this London fixed effect is not driven by the inward migration of highly productive authors.

authors develop a dedicated readership and are therefore less driven by the need to compete for readership in the later stages of their career. Older, established authors could have other careers (e.g., university lecturer positions) or other income supports (e.g., awards and fellowships). Therefore, the stability of their income and thus their drive to publish is not as subject to contemporary market pressures.

The results also indicate that co-located social connections have no statistically significant impact of author productivity through the channels tested in this study. This could indicate that cities are not optimal level of agglomeration for detecting gains from social interaction effects. For example, anecdotal evidence on the "Lost Generation" of writers, artists and other creative workers in Paris in the 1920s suggests that the spillovers occurred within social networks that included people from a number of creative industries. It is possible that co-location enabled network formation but that, once these networks are formed, spillovers within the network occur even if the members are later geographically dispersed. More detailed social network information on the wider network of artists, authors, intellectuals, critics, and publishers could provide important insights, particularly dynamic social network information, could provide important insights.

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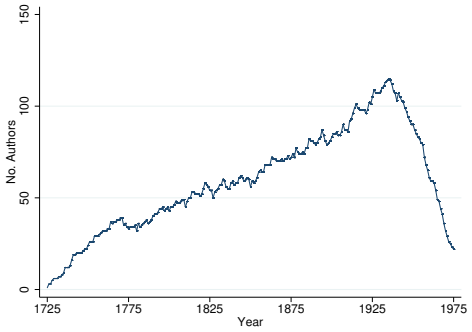
A Figures

Figure 1: Author Population over Time

(a) No. Authors



(b) No. Authors in London

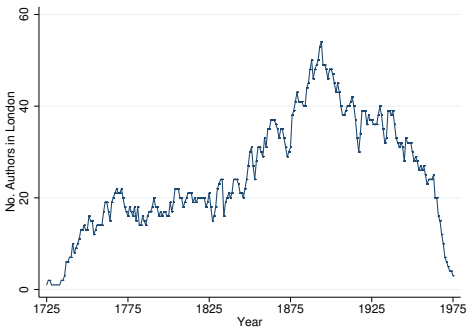
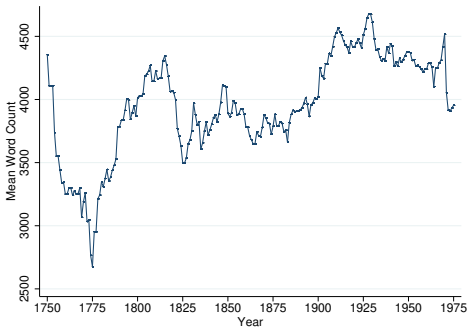
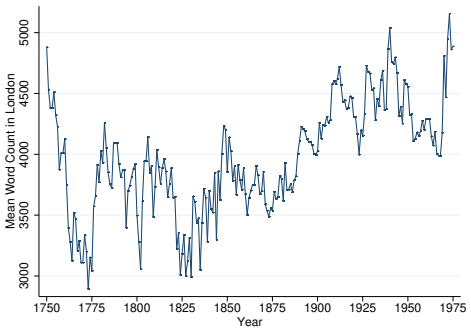


Figure 2: Author Quality over Time

(a) Mean Word Count



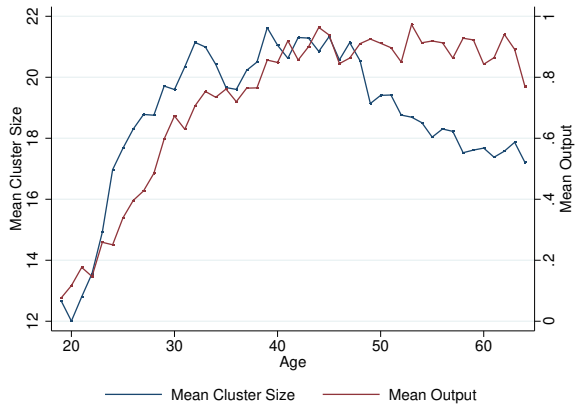
(b) Mean Word Count in London



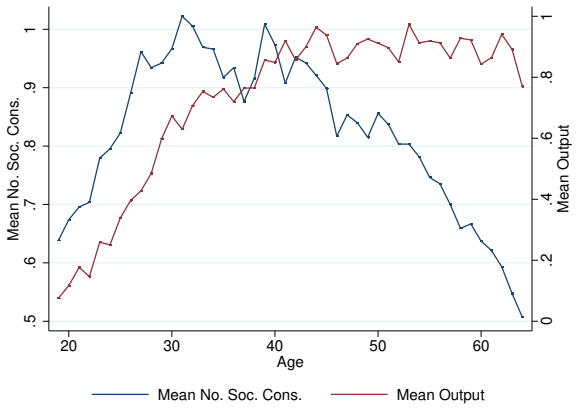
Note: Due to the small number of co-located authors present at the start of the sample, these graphs are limited to 1750-1975.

Figure 3: Lifecycle Trend in Output and Cluster Size

(a) No. Co-Located Authors



(b) No. Co-Located Social Connections



B Tables

Table 1: List of authors included in this study

Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
A. A. Milne	1882	1956	3118	65	35
A. E. Housman	1859	1936	3082	11	28
AE (George William Russell)	1867	1935	2315	11	0
Aldous Huxley	1894	1963	7455	70	7
Alexander Harris	1805	1874	153	5	31
Alfred Austin	1835	1913	1273	55	62
Alfred Tennyson	1809	1892	6580	38	16
Algernon Swinburne	1837	1909	6901	81	42
Alice Meynell	1847	1922	6996	36	52
Allan Cunningham	1784	1842	236	23	33
Alun Lewis	1915	1944	1377	3	0
Amelia Opie	1769	1853	5278	35	8
Andrew Lang	1844	1912	2778	128	37
Angela Thirkell	1890	1961	2816	11	63
Ann Radcliffe	1764	1823	5870	6	37
Anna Barbauld	1743	1825	4876	17	39
Anna Seward	1747	1809	2506	15	0
Anna Sewell	1820	1878	713	1	44
Anne Brontë	1820	1849	6373	3	0
Anthony Burgess	1917	1993	4290	63	9
Anthony Hope	1863	1933	2741	48	44
Anthony Trollope	1815	1882	4818	67	32
Arnold Bennett	1867	1931	6788	82	23
Arthur Henry Hallam	1811	1833	1794	4	10
Arthur Hugh Clough	1819	1861	4619	6	10
Arthur Koestler	1905	1983	2420	45	34
Arthur Michell Ransome	1884	1967	2553	19	24
Arthur O'Shaughnessy	1844	1881	167	5	38
Arthur Symons	1865	1945	3242	104	19
Arthur Young	1741	1820	971	24	57
Augusta (Lady Gregory)	1852	1932	4087	54	0
Austin Dobson	1840	1921	787	59	66
Barbara Mary Crampton Pym	1913	1980	4781	9	35
Baron Thomas Babington Macaulay	1800	1859	3791	16	41
Bram Stoker	1847	1912	4979	20	34
Brendan Behan	1923	1964	4172	9	0
Bryher (Annie Winifred Ellerman)	1894	1983	906	12	29
C. Day-Lewis	1904	1972	3681	65	35
C. P. Snow	1905	1980	4521	41	41
C. S. Forester	1899	1966	5881	21	64
C. S. Lewis	1898	1963	5821	45	0

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
Charles Churchill	1731	1764	2050	17	31
Charles Dickens	1812	1870	12070	33	35
Charles Kingsley	1819	1875	4110	55	2
Charles Lamb	1775	1834	4432	19	60
Charles Montagu Doughty	1843	1926	4207	13	0
Charles Reade	1814	1884	4993	48	46
Charles Robert Maturin	1782	1824	5293	11	0
Charles Wesley	1707	1788	5387	63	41
Charles Wolfe	1791	1823	701	1	0
Charlotte Brontë	1816	1855	6722	4	0
Charlotte Lennox	1729	1804	4870	18	62
Charlotte M. Yonge	1823	1901	4875	187	6
Charlotte Mew	1869	1928	3673	5	60
Charlotte Smith	1749	1806	4988	22	30
Christina Rossetti	1830	1894	4991	19	64
Christopher Anstey	1724	1805	124	3	0
Christopher Smart	1722	1771	4005	31	23
Compton Mackenzie	1883	1972	5820	129	16
Coventry Patmore	1823	1896	2230	18	41
D. H. Lawrence	1885	1930	11105	57	7
Dame Agatha Christie	1890	1976	5140	116	16
Dame Edith Sitwell	1887	1964	6095	53	40
Dame Iris Murdoch	1919	1999	9626	48	15
Dame Ivy Compton-Burnett	1884	1969	3414	19	56
Dame Rebecca West	1892	1983	6111	24	28
Dame Rose Macaulay	1881	1958	5417	38	47
Daniel Owen	1836	1895	220	7	0
Dante Gabriel Rossetti	1828	1882	7133	13	53
David Garrick	1717	1779	4518	91	39
David Jones	1895	1974	5461	6	65
Donagh MacDonagh	1912	1968	129	8	0
Donald Alfred Davie	1922	1995	1914	43	0
Dorothy M. Richardson	1873	1957	3555	15	55
Douglas William	1803	1857	1963	42	45
Dylan Thomas	1914	1953	8572	11	10
E. C. Bentley	1875	1956	1520	8	78
E. M. Forster	1879	1970	7062	45	48
Edmund Charles Blunden	1896	1974	4292	130	8
Edward Carpenter	1844	1929	1918	50	0
Edward Dowden	1843	1913	615	37	0
Edward FitzGeral	1809	1883	5562	16	1
Edward George Bulwer-Lytton	1803	1873	3802	66	62
Edward Lear	1812	1888	5621	10	25
Edward Martyn	1859	1923	4161	15	10
Edward Robert Bulwer-Lytton	1831	1891	315	21	15
Edward Thomas	1878	1917	5520	48	25

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
Edwin Muir	1887	1959	7896	26	2
Elizabeth Barrett Browning	1806	1861	4776	10	9
Elizabeth Bowen	1899	1973	6298	42	23
Elizabeth Cleghorn	1810	1865	5250	5	2
Elizabeth Taylor	1912	1975	4462	17	0
Ellis Peters	1913	1995	1121	53	0
Emily Brontë	1818	1848	5176	3	0
Emlyn Williams	1905	1987	1169	10	61
Eric Ambler	1909	1998	3685	26	61
Ernest Dowson	1867	1900	1740	14	26
Evelyn Underhill	1875	1941	2521	7	66
Fanny Burney	1752	1840	5536	6	49
Fanny Kemble	1809	1893	4525	11	26
Felicia Dorothea Hemans	1793	1835	3804	23	0
Flann O'Brien	1911	1966	6303	6	0
Ford Madox Ford	1873	1939	4511	78	23
Forrest Reid	1875	1947	1955	24	0
Frances Cornford	1886	1960	1485	10	0
Francis Thompson	1859	1907	1843	9	17
Francis Turner Palgrave	1824	1897	777	26	52
Frank O'Connor	1903	1966	2824	39	0
Frederic William Farrar	1831	1903	1491	13	38
Frederick Marryat	1792	1848	1156	31	24
Frederick William Rolfe	1860	1913	3794	11	26
G. K. Chesterton	1874	1936	5163	115	35
George Barker	1913	1991	2834	40	37
George Bernard Shaw	1856	1950	8083	76	67
George Borrow	1803	1881	4460	13	24
George Colman the Elder	1732	1794	2046	44	58
George Colman the Younger	1762	1836	2170	34	71
George Crabbe	1754	1832	3499	15	4
George Darley	1795	1846	3202	16	21
George Douglas	1869	1902	1952	2	8
George Eliot	1819	1880	6720	19	30
George Gissing	1857	1903	6327	29	22
George Gordon Byron	1788	1824	9780	43	13
George Henry Lew	1817	1878	4063	17	56
George Macdonald	1824	1905	5502	55	24
George Mackay Brown	1921	1996	6814	60	0
George Meredith	1828	1909	8612	31	7
George Moore	1852	1933	10278	59	44
George Orwell	1903	1950	10202	21	12
George du Maurier	1834	1896	1525	3	48
Gerard Manley Hopkins	1844	1889	5281	2	26
Graham Greene	1904	1991	7304	95	38
H. G. Wells	1866	1946	6776	145	52

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
Harriet Martineau	1802	1876	4455	19	4
Hartley Coleridge	1796	1849	2184	3	4
Helen Maria Williams	1762	1827	5834	29	19
Henry Fielding	1707	1754	8425	42	26
Henry James Pye	1745	1813	127	7	65
Henry Kingsley	1830	1876	1596	20	15
Henry Luttrell	1765	1851	180	3	49
Henry Mackenzie	1745	1831	5191	15	2
Henry Williamson	1895	1977	1061	63	22
Hester Lynch Piozzi	1740	1821	3582	8	29
Hilaire Belloc	1870	1953	5919	158	15
Horace Walpole	1717	1797	4259	46	67
Hugh Kelly	1739	1777	205	8	18
Hugh MacDiarmid	1892	1978	7087	41	1
I. A. Richards	1893	1979	5276	24	0
Ian Fleming	1908	1964	3347	17	29
Isaac Bickerstaff	1735	1812	165	18	9
Isaac Rosenberg	1890	1918	6749	3	17
Israel Zangwill	1864	1926	1551	15	22
J. B. Priestley	1894	1984	2873	131	1
J. M. Barrie	1860	1937	3738	56	49
J. R. R. Tolkien	1892	1973	6310	26	0
Jack Thomas Grein	1862	1935	172	2	51
James Beattie	1735	1803	1296	19	0
James Clarence Mangan	1803	1849	3826	2	0
James Herriot	1916	1995	1009	20	0
James Hogg	1770	1835	4468	34	0
James Joyce	1882	1941	16025	23	0
James Macpherson	1736	1796	3009	10	29
James Montgomery	1771	1854	1120	11	0
James Stephens	1880	1950	3338	35	26
James Thomson	1700	1748	4601	20	20
James Thomson (Bysse Vanolis)	1834	1882	5253	8	27
Jane Austen	1775	1817	8284	4	0
Jean Ingelow	1820	1897	1773	28	48
Jennie Jerome Churchill	1854	1921	261	4	48
Joanna Baillie	1762	1851	3802	13	66
John Addington Symonds	1840	1893	5038	20	8
John Barrington Wain	1925	1994	1368	54	1
John Braine	1922	1987	1422	15	1
John Buchan	1875	1940	5041	83	15
John Clare	1793	1864	4631	4	1
John Cleland	1709	1789	3918	9	63
John Cowper Powys	1875	1953	5393	43	0
John Davidson	1857	1909	2713	41	18
John Drinkwater	1882	1937	1731	144	27

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
John Galsworthy	1867	1933	8507	88	42
John Galt	1779	1839	5167	51	23
John Home	1722	1808	4244	10	0
John Keats	1795	1821	7865	5	24
John Keble	1792	1866	1309	47	0
John Langhorne	1735	1779	89	2	5
John Lehmann	1907	1987	2070	12	51
John Masefield	1878	1967	3865	115	18
John Millington Synge	1871	1909	4083	9	0
John Wilson Croker	1780	1857	259	22	52
John Wyndham	1903	1969	8724	19	38
Joseph Blanco White	1777	1841	1199	5	16
Joseph Conrad	1857	1924	9630	62	6
Joseph Warton	1722	1800	1211	11	1
Joyce Cary	1888	1957	1290	57	5
Katherine Mansfield	1888	1923	5627	7	10
Keith Castellain Douglas	1920	1944	1953	3	0
Kenneth Grahame	1859	1932	3215	4	29
L. P. Hartley	1895	1972	2093	26	17
Lady Anne Barnard	1750	1825	100	1	24
Lady Sydney Morgan	1776	1859	1379	19	21
Lascelles Abercrombie	1881	1938	1766	17	9
Laurence Binyon	1869	1943	4409	135	50
Laurence Sterne	1713	1768	7008	6	6
Laurie Lee	1914	1997	2495	28	21
Lawrence Durrell	1912	1990	6030	61	12
Leigh Hunt	1784	1859	4754	50	72
Letitia Elizabeth Landon	1802	1838	3902	21	36
Lewis Carroll	1832	1898	7100	49	3
Lewis Grassic Gibbon	1901	1935	3391	17	2
Lionel Johnson	1867	1902	2640	8	13
Louis MacNeice	1907	1963	7417	31	16
Malcolm Lowry	1909	1957	4913	3	1
Margaret Oliphant	1828	1897	2919	116	9
Margery Allingha	1904	1966	1684	32	2
Marguerite Gardiner	1789	1849	283	4	29
Maria Edgeworth	1767	1849	5475	33	0
Marie Corelli	1855	1924	3404	55	34
Mark Akenside	1721	1770	2831	16	24
Mark Rutherford	1831	1913	2354	17	40
Mary Elizabeth Braddon	1837	1915	3840	91	69
Mary Gladys Webb	1881	1927	3509	6	6
Mary Russell Mitford	1787	1855	2048	21	4
Mary Wollstonecraft	1759	1797	4165	9	19
Matthew Arnold	1822	1888	6745	49	34
Matthew Gregory	1775	1818	4135	23	37

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
Mervyn Peake	1911	1968	4620	16	31
Michael Arlen	1895	1956	790	18	14
Mina Loy	1882	1966	1788	4	20
Mrs. Henry Wood	1814	1887	3014	31	32
Mrs. Humphry Ward	1851	1920	6138	42	40
Nancy Mitford	1904	1973	1943	18	39
Neil Miller Gunn	1891	1973	5122	16	2
Norman Douglas	1868	1952	3039	29	16
Norman MacCaig	1910	1996	3454	26	0
Oliver Goldsmith	1730	1774	4896	45	19
Oliver St. John Gogarty	1878	1957	1641	7	0
Olivia Manning	1908	1980	4116	20	44
Oscar Wilde	1854	1900	6834	16	15
Ouida (Maria Louise Ramé	1839	1908	801	52	19
Paul Scott	1920	1978	4202	15	50
Percy Bysshe Shelley	1792	1822	7294	27	5
Peter Pindar	1738	1819	241	66	39
Philip James Bailey	1816	1902	147	7	1
Philip Larkin	1922	1985	4274	10	0
Pierce Egan the Elder	1772	1849	75	11	78
R. C. Sherriff	1896	1975	1359	24	34
R. M. Ballantyne	1825	1894	2834	94	12
Rex Ernest Warner	1905	1986	6311	33	4
Richard Aldington	1892	1962	5703	54	15
Richard Brinsley Butler Sheridan	1751	1816	7891	47	54
Richard Cumberland	1732	1811	293	31	25
Richard Doddridge	1825	1900	2931	21	52
Richard Jefferie	1848	1887	2369	23	11
Richard Owen Cambridge	1717	1802	152	2	63
Roald Dahl	1916	1990	5513	39	12
Robert Bloomfield	1766	1823	4425	6	31
Robert Bridges	1844	1930	3158	70	13
Robert Browning	1812	1889	7254	29	61
Robert Burns	1759	1796	7031	6	0
Robert Fergusson	1750	1774	2172	4	0
Robert Graves	1895	1985	8537	131	21
Robert Louis Stevenson	1850	1894	8941	41	0
Robert Southey	1774	1843	7120	52	4
Robert Williams Buchanan	1841	1901	3123	78	33
Ronald Duncan	1914	1982	1357	12	18
Ronald Firbank	1886	1926	3957	11	19
Rosamond Nina Lehmann	1901	1990	4528	17	50
Roy Fuller	1912	1991	2355	57	44
Rudyard Kipling	1865	1936	8752	165	4
Rumer Godden	1907	1998	3119	61	30
Rupert Brooke	1887	1915	4460	5	0

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
Saint John Ervin	1883	1971	168	10	67
Saki (Hector Hugh Munro)	1870	1916	1894	11	17
Samuel Bamford	1788	1872	1710	10	8
Samuel Beckett	1906	1989	10085	57	0
Samuel Butler	1835	1902	5777	19	40
Samuel Foote	1720	1777	2137	22	35
Samuel Johnson	1709	1784	11759	46	46
Samuel Lover	1798	1868	670	10	27
Samuel Taylor Coleridge	1772	1834	10129	35	32
Sapper (Herman Cyril McNeile)	1888	1937	1980	18	2
Sara Coleridge	1802	1852	1856	6	24
Sarah Fielding	1710	1768	4134	10	15
Sean O'Faolain	1900	1991	989	12	5
Sheridan Le Fanu	1814	1873	5247	18	1
Siegfried Sassoon	1886	1967	1865	55	13
Sir Angus Frank Johnstone Wilson	1913	1991	3465	37	28
Sir Arthur Conan Doyle	1859	1930	6779	69	4
Sir Arthur Thomas Quiller-Couch	1863	1944	2096	16	5
Sir Arthur Wing Pinero	1855	1934	5073	53	78
Sir Edmund Gosse	1849	1928	4979	80	64
Sir Edwin Arnold	1832	1904	1307	50	42
Sir Hall Caine	1853	1931	886	34	11
Sir Henry John Newbolt	1862	1938	1918	13	53
Sir Herbert Read	1893	1968	3033	21	12
Sir Hugh Seymour Walpole	1884	1941	819	8	29
Sir John Betjeman	1906	1984	10112	55	13
Sir Kingsley Amis	1922	1995	8107	73	50
Sir Max Beerbohm	1872	1956	5086	28	29
Sir Noël Coward	1899	1973	5932	53	58
Sir Osbert Sitwell	1892	1969	2133	20	18
Sir Owen Morgan	1858	1920	165	1	0
Sir P. G. Wodehouse	1881	1975	5885	103	34
Sir Stephen Spender	1909	1995	3529	65	62
Sir Terence Rattigan	1911	1977	4393	20	41
Sir W. S. Gilbert	1836	1911	3602	72	66
Sir Walter Besant	1836	1901	2137	87	39
Sir Walter Scott	1771	1832	6502	77	0
Sir William Empson	1906	1984	6860	17	49
Sir William Golding	1911	1993	5170	20	0
Sir Winston Churhill	1874	1965	8332	53	71
Stevie Smith	1902	1971	4213	14	62
Susan Edmonstone Ferrier	1782	1854	3282	3	0
Sydney Thompson Dobell	1824	1874	1565	7	1
Sylvia Townsend Warner	1893	1978	5085	38	40
T. E. Hulme	1883	1917	2854	5	6
T. H. White	1906	1964	2746	25	0

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
T. S. Eliot	1888	1965	6708	127	51
Theodore Watts-Dunton	1832	1914	1830	17	62
Thomas Campbell	1777	1844	2868	21	38
Thomas Carlyle	1795	1881	8754	25	44
Thomas De Quincey	1785	1859	7061	28	2
Thomas Gray	1716	1771	4733	5	9
Thomas Hardy	1840	1928	6626	39	10
Thomas Holcroft	1745	1809	3230	8	58
Thomas Hood	1799	1845	2052	13	40
Thomas Hughes	1822	1896	1027	7	16
Thomas Love Peacock	1785	1866	7968	24	18
Thomas Lovell Beddoes	1803	1849	4650	2	7
Thomas Moore	1779	1852	5328	54	7
Thomas Osborne Davis	1814	1845	135	1	0
Thomas Pringle	1789	1834	2610	7	9
Thomas Warton the Younger	1728	1790	4401	24	0
Thomas William Robertson	1829	1871	3701	8	24
Tobias Smollett	1721	1771	6792	33	15
V. S. Pritchett	1900	1997	1906	49	89
Vernon Phillips	1906	1967	2716	11	0
Virginia Woolf	1882	1941	12840	35	59
Vita Sackville-West	1892	1962	3261	56	4
W. H. Hudson	1841	1922	2407	37	49
W. Somerset Maugham	1874	1965	5928	80	26
W.H. Auden	1907	1973	10551	138	0
Walter Macken	1915	1967	686	9	1
Walter Pater	1839	1894	6055	70	27
Walter de la Mare	1873	1956	3030	95	70
Wilfrid Scawen Blunt	1840	1922	254	23	0
Wilkie Collins	1824	1889	5422	48	61
William Archer	1856	1924	1667	19	47
William Barnes	1801	1886	3438	37	0
William Beckford	1760	1844	4258	11	6
William Blake	1757	1827	12099	23	68
William Butler Yeats	1865	1939	10908	84	44
William Collins	1721	1759	3973	5	10
William Cowper	1731	1800	6841	20	22
William Edmondstoune Aytoun	1813	1865	249	4	1
William Ernest Henley	1849	1903	2608	31	29
William Gifford	1756	1826	1375	3	44
William Harrison Ainsworth	1805	1882	2913	50	42
William Hayley	1745	1820	2484	10	15
William Hazlitt	1778	1830	4950	25	34
William Henry Davies	1871	1940	3683	43	16
William Lisle Bowles	1762	1850	265	10	0
William Makepeace Thackeray	1811	1863	5991	37	41

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Author Name	Year of Birth	Year of Death	Word Count	Total Works	Years in London
William Morris	1834	1896	6112	75	45
William Soutar	1898	1943	1749	4	0
William Whitehead	1715	1785	1843	8	38
William Wordsworth	1770	1850	8967	34	2
Winthrop Mackworth Praed	1802	1839	181	7	11
Wyndham Lewis	1882	1957	6212	46	45

Source: All information was obtained from Encyclopaedia Britannica (2014), Literature Online (2014), and The Literary Encyclopaedia (2014).

Table 2: Overall Summary Statistics

	Full Sample	1725-1774	1775-1824	1825-1874	1875-1924	1925-1974
Year of Birth	1837	1723	1763	1813	1862	1901
	(59.42)	(12.07)	(19.23)	(19.08)	(19.69)	(13.35)
Age at Publication	43.32	37.48	39.31	41.18	43.24	46.76
	(11.49)	(9.894)	(11.49)	(11.09)	(11.45)	(10.85)
Year of Publication	1888	1758	1803	1852	1901	1945
	(57.89)	(11.12)	(14.34)	(15.11)	(14.34)	(13.35)
Word Count	4067.6	3779.2	3864.6	3807.0	4158.4	4361.6
	(2685.7)	(2714.3)	(2839.1)	(2477.7)	(2737.6)	(2657.3)
Cluster Size	18.70	10.23	11.98	17.03	30.39	13.79
	(22.89)	(10.39)	(13.65)	(18.94)	(29.94)	(18.59)
Authors per Year	72.24	28.60	45.32	62.75	86.37	91.59
	(25.08)	(9.002)	(7.015)	(6.305)	(8.938)	(23.19)
No. Authors	369	47	99	140	193	145
No. Obs	14811	1127	2209	3106	4273	4074

Note: Standard deviations are in parentheses.

Table 3: London Summary Statistics

	Full Sample	1725-1774	1775-1824	1825-1874	1875-1924	1925-1974
Year of Birth	1831	1722	1760	1814	1859	1899
	(58.54)	(11.95)	(18.16)	(18.29)	(19.00)	(12.74)
Age at Publication	42.72	38.20	39.39	40.38	43.50	46.44
	(11.15)	(9.245)	(11.89)	(10.49)	(11.42)	(10.17)
Year of Publication	1878	1757	1800	1853	1899	1944
	(58.43)	(11.35)	(14.31)	(14.94)	(13.56)	(12.96)
Word Count	4040.3	4105.7	3755.1	3671.6	4118.8	4441.8
	(2642.0)	(2844.8)	(3041.3)	(2547.0)	(2589.1)	(2359.7)
Cluster Size	42.72	19.62	27.90	38.58	60.28	39.14
	(15.15)	(5.640)	(4.523)	(4.609)	(6.361)	(8.251)
Avg. Authors	31.13	15.59	18.37	28.12	42.94	30.81
	(11.25)	(4.835)	(2.099)	(6.185)	(5.336)	(7.207)
No. Authors	307	36	60	94	140	84
No. Obs.	6279	573	906	1331	2113	1353

Note: Standard deviations are in parentheses.

Table 4: Summary Statistics of Clusters

	All Clusters		*London Cluster*	
Variable	Mean	St. Dev.	Mean	St. Dev.
All Authors				
Cluster Size	30.72	22.17	42.74	15.13
Cluster Output	0.56	0.45	0.60	0.23
Cluster Word Count	4149.71	1157.06	4086.35	388.60
Social Connections				
No. Social	1.33	1.84	1.70	2.02
Social Output	0.44	0.83	0.55	0.89
Social Word Count	2981.35	3160.74	3463.57	3066.84
Other Authors				
No. Others	29.39	21.76	41.04	15.20
Other Output	0.53	0.44	0.59	0.23
Other Word Count	3906.60	1287.23	4020.26	436.40

Note: All means are defined as leave-out means (i.e. exclude own-author values.)

Table 5: Overall Cluster Effects: Size, Quality, and Output Channels

	(1) Baseline	(2) London Dummy	(3) London Interaction
Cluster Size	0.00290**	-0.00295	-0.0132
	(0.00147)	(0.00301)	(0.0130)
Cluster Quality	-0.00000715	-0.0000107	-0.00000322
	(0.0000110)	(0.0000108)	(0.0000122)
Cluster Output$_{t-1}$	0.0229	0.0225	0.00730
	(0.0312)	(0.0312)	(0.0346)
London		0.290**	0.894***
		(0.116)	(0.295)
London*Cluster Size			0.0108
			(0.0126)
London*Cluster Quality			-0.000168**
			(0.0000696)
London*Cluster Output$_{t-1}$			0.0916
			(0.0567)
Age Quadratic	Yes	Yes	Yes
Constant Term	Yes	Yes	Yes
Author FE	Yes	Yes	Yes
5-year time dummies	Yes	Yes	Yes
R^2	0.094	0.095	0.096
Authors	369	369	369
Observations	14442	14442	14442

Robust standard errors are clustered on the author level and are reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Decomposed General Cluster Effects: Social Connections vs Others

	(1) Quantity	(2) Quality	(3) Output	(4) All Channels	(5) London Dummy
No. Social	0.00652			0.0105	0.00103
	(0.0198)			(0.0224)	(0.0229)
Social Quality		0.00000363		-0.00000364	-0.00000495
		(0.00000509)		(0.00000721)	(0.00000732)
Social Output$_{t-1}$			0.00174	-0.00967	-0.0103
			(0.0207)	(0.0212)	(0.0213)
No. Others	0.00248*			0.00328*	-0.00268
	(0.00140)			(0.00184)	(0.00304)
Other Quality		0.00000775		-0.0000108	-0.0000158
		(0.00000775)		(0.0000124)	(0.0000122)
Other Output$_{t-1}$			0.0474	0.0172	0.0182
			(0.0328)	(0.0321)	(0.0320)
London					0.310***
					(0.118)
Age Quadratic	Yes	Yes	Yes	Yes	Yes
Constant Term	Yes	Yes	Yes	Yes	Yes
Author FE	Yes	Yes	Yes	Yes	Yes
5-year time dummies	Yes	Yes	Yes	Yes	Yes
R^2	0.103	0.101	0.092	0.094	0.095
No. Authors	369	369	369	369	369
Observations	14811	14811	14442	14442	14442

Robust standard errors are clustered on the author level and are reported in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Decomposed London Cluster Effects: Social Connections vs Others

	(1) Quantity	(2) Quality	(3) Output	(4) Full Model
No. Social	-0.0230			-0.0360
	(0.0452)			(0.0639)
Social Quality		-0.00000275		0.00000425
		(0.00000750)		(0.0000112)
Social Output$_{t-1}$			-0.00708	-0.000579
			(0.0377)	(0.0378)
No. Others	-0.0117			-0.00374
	(0.0118)			(0.0147)
Quality of Others		-0.0000131		-0.0000118
		(0.0000112)		(0.0000144)
Output of Others$_{t-1}$			-0.0157	-0.000751
			(0.0319)	(0.0354)
No. Social*London	0.0226			0.0363
	(0.0486)			(0.0672)
Social Quality*London		-0.00000905		-0.0000142
		(0.0000128)		(0.0000158)
Social Output*London$_{t-1}$			-0.0122	-0.0108
			(0.0437)	(0.0437)
No. Others*London	0.00898			0.00176
	(0.0125)			(0.0144)
Other Quality*London		-0.000151**		-0.000154**
		(0.0000612)		(0.0000607)
Other Output*London$_{t-1}$			0.0661	0.0952*
			(0.0624)	(0.0566)
London	0.244**	0.833***	0.129***	0.875***
	(0.122)	(0.247)	(0.0426)	(0.264)
Age Quadratic	Yes	Yes	Yes	Yes
Constant Term	Yes	Yes	Yes	Yes
Author FE	Yes	Yes	Yes	Yes
5-year time dummies	Yes	Yes	Yes	Yes
R^2	0.104	0.105	0.095	0.096
No. Authors	369	369	369	369
Observations	14811	14811	14442	14442

Robust standard errors are clustered on the author level and are reported in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Early-Career vs Late-Career Effects

	(1) Age <40	(2) Age 40+
No. Social	0.0461	-0.0549
	(0.0562)	(0.101)
Social Quality	0.00000260	0.0000187
	(0.0000110)	(0.0000145)
Social Output$_{t-1}$	0.0510	-0.0457
	(0.0563)	(0.0392)
No. Others	0.00572	0.00849
	(0.0147)	(0.0258)
Other Quality	-0.00000939	0.000000660
	(0.0000125)	(0.0000121)
Other Output$_{t-1}$	-0.0992***	0.0495
	(0.0298)	(0.0605)
No. Social*London	-0.0543	0.0417
	(0.0603)	(0.105)
Social Quality*London	-0.00000771	-0.00000637
	(0.0000164)	(0.0000209)
Social Output*London$_{t-1}$	-0.0173	0.0215
	(0.0691)	(0.0453)
No. Others*London	-0.00914	-0.00530
	(0.0145)	(0.0261)
Other Quality*London	-0.000214**	-0.000122
	(0.0000838)	(0.000112)
Other Output*London$_{t-1}$	0.181***	0.0308
	(0.0593)	(0.103)
London	1.064***	0.479
	(0.334)	(0.464)
Age Quadratic	Yes	Yes
Constant Term	Yes	Yes
Author FE	Yes	Yes
5-year time dummies	Yes	Yes
R^2	0.115	0.020
Authors	369	337
Observations	7187	7255

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Robust standard errors are clustered on the author level and are reported in parentheses.