

# Mixing and Segregation of Authors' Gender, "Culture" and Open Access in Publications on *Digital Humanities* from 1998 to 2018

Moses A. Boudourides<sup>1</sup>

Robert K. Merton Visiting Research Fellow 2019, IAS, LiU  
Northwestern University School of Professional Studies

<sup>1</sup> Moses.Boudourides@gmail.com

With Giannis Tsakonas & Sergios Lenis

*Seminarium - P6: Kropp, Kunskap, Subjektivitet*  
Department of Thematic Studies - Technology and Social Change  
Linköping University, Linköping, Sweden

March 14, 2019

# The Digital Humanities Web of Science Dataset at a Glance

1064 publications from 1998 to 2018 retrieved from the Web of Science (WoS) bibliometric database under the topic of *Digital Humanities* (DH) which included (among other variables):

- ▶ 1007 (co-)authors
- ▶ 1761 individual authors:
  - ▶ 806 female authors
  - ▶ 953 male authors
  - ▶ 2 undetermined gender authors
- ▶ 52 research areas
- ▶ 10 Open Access types

# History of the first appearances of the DH term in the WoS Dataset

- ▶ **1998:** first time a publication included DH in the **Abstract** field (Green, D., *The National Initiative for a Networked Cultural Heritage in INFORMATION TECHNOLOGY AND LIBRARIES*)
- ▶ **2002:** first time a publication included DH in the **Title** field (Kirschenbaum, M.G., *Archive (Digital humanities research)* in PERFORMANCE RESEARCH)
- ▶ **2008:** first time a publication included DH in the **Author Keywords** field (Donaldson, Peter S., *The Shakespeare Electronic Archive: Collections and multimedia tools for teaching and research, 1992-2008* in SHAKESPEARE)
- ▶ **2014:** first time a publication included DH in the **WoS Keywords** field (Verleye, Zeger, *Special Democratic jazz and Roman Catholic grocers: A history of the semantic field of compartmentalization in the Netherlands and Belgium, approx. 1900-1950*, TIJDSCHRIFT VOOR GESCHIEDENIS)

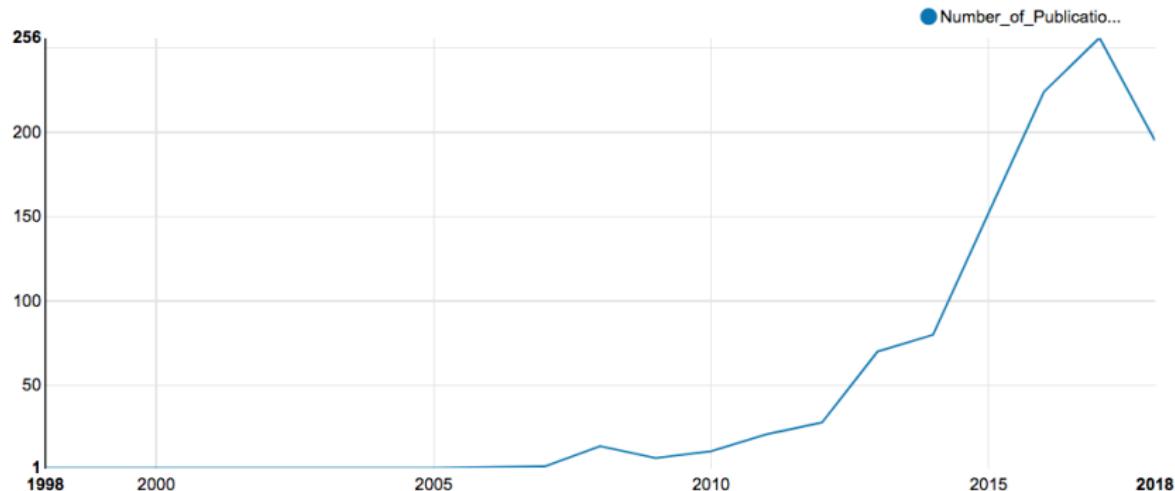
# Publications & Authors

## Number of Publications per Year

FINISHED ▶ 🔍 📄 ⚙



settings ▾

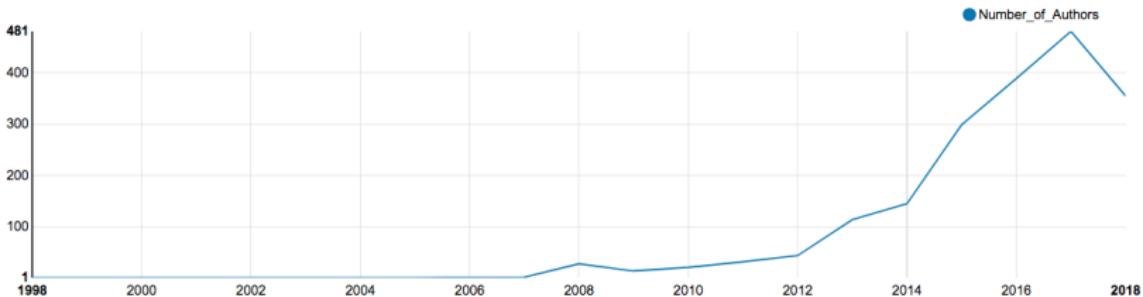


### Number of Individual Authors per Year

FINISHED ▶ ⌂ ⌂ ⌂ ⌂



settings ▾

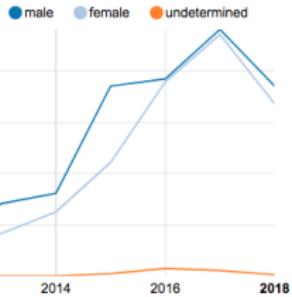


Took 49 sec. Last updated by mab at March 12 2019, 3:25:58 PM. (outdated)

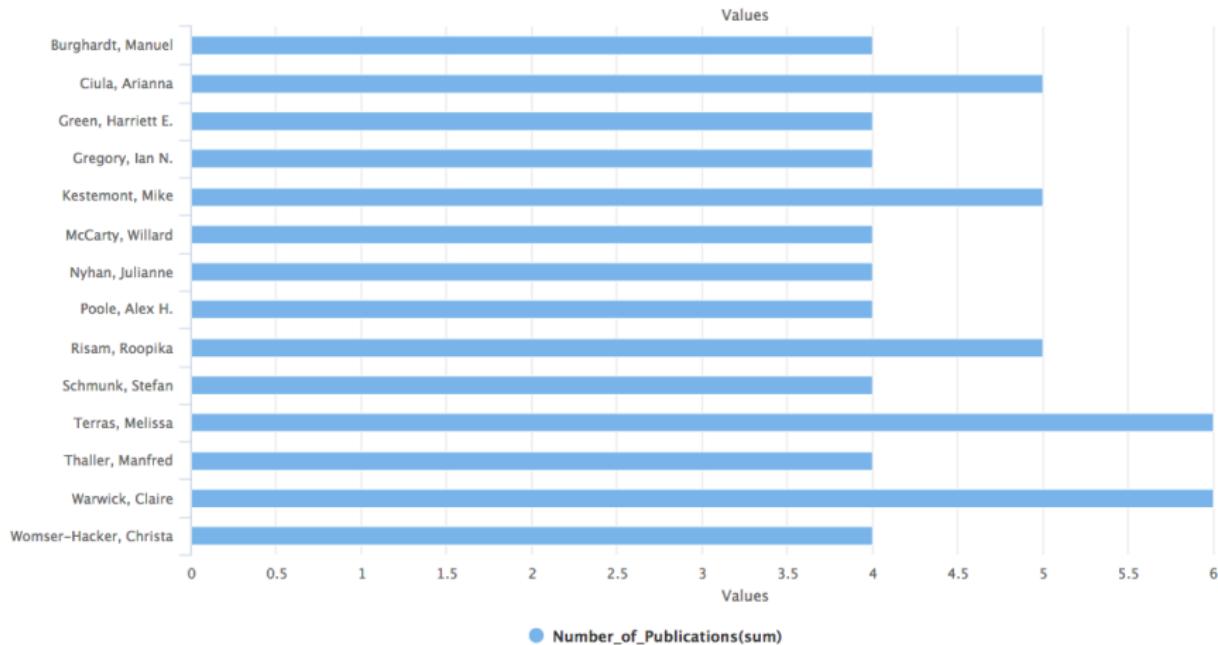
FINISHED ▶ ⌂ ⌂ ⌂ ⌂

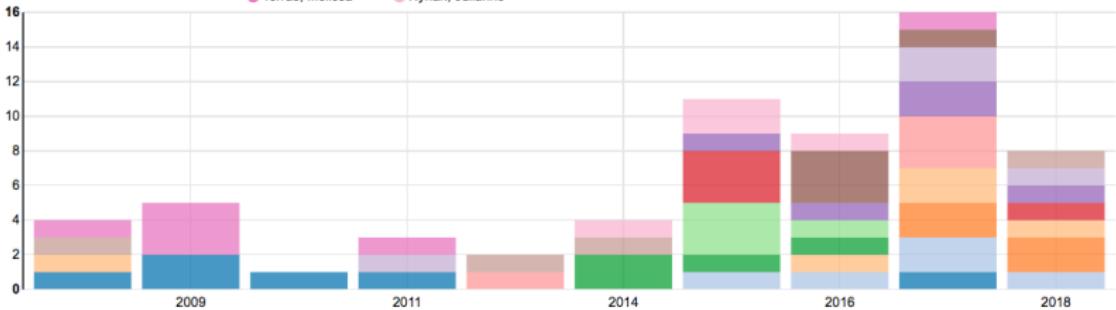


settings ▾

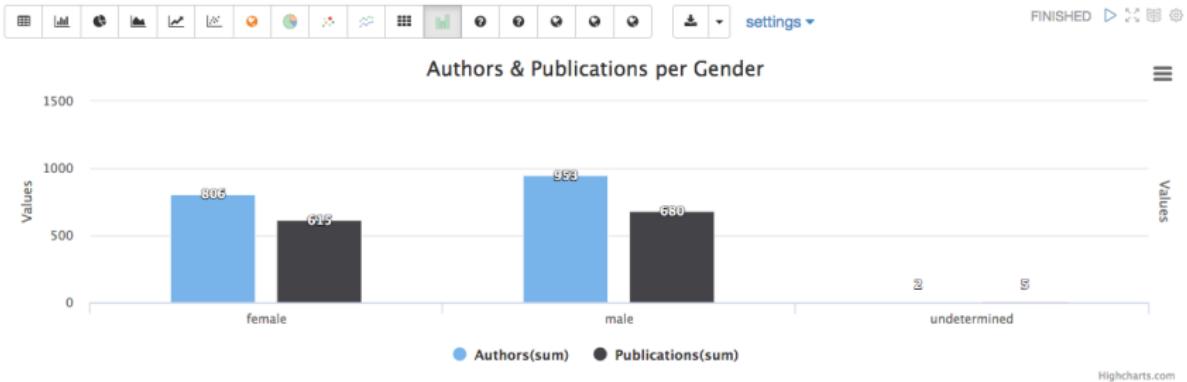


### Top Individual Authors

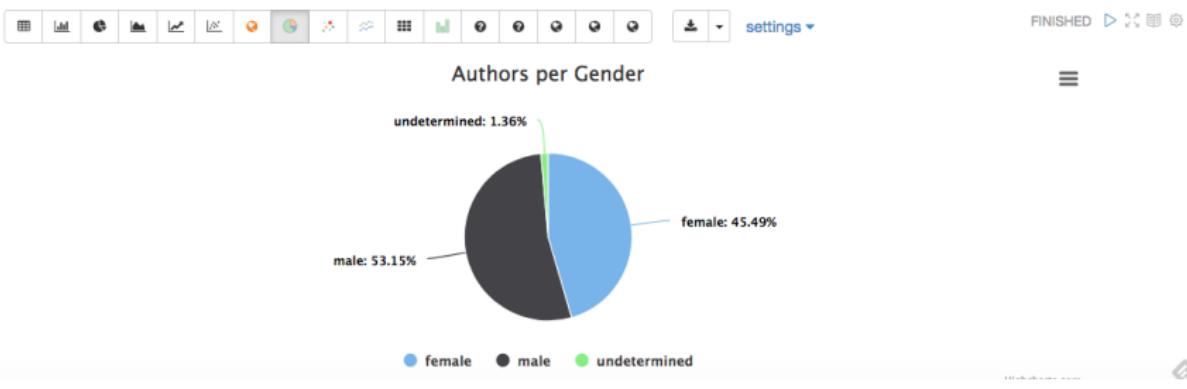




# Gender



Took 37 sec. Last updated by mab at March 03 2019, 8:28:53 PM. (outdated)



## Gender Segregation Index in a Publication =

$$\frac{\text{number of female authors} - \text{number of male authors}}{\text{number of female authors} + \text{number of male authors}}$$

Histogram of Number of Publication per Author Gender Segregation Indices

FINISHED

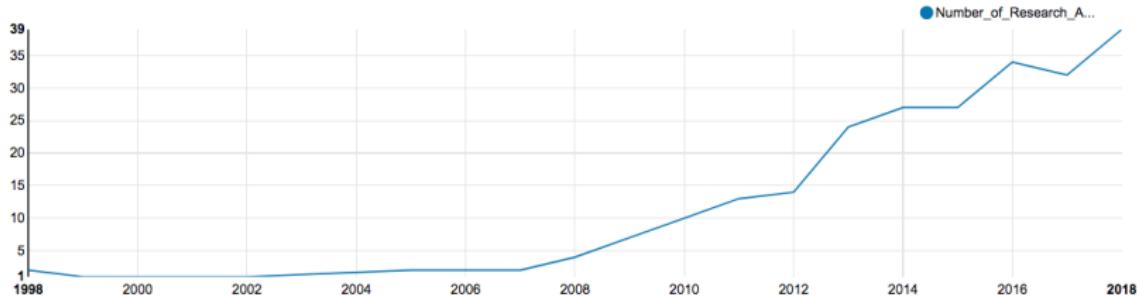


# Research Areas

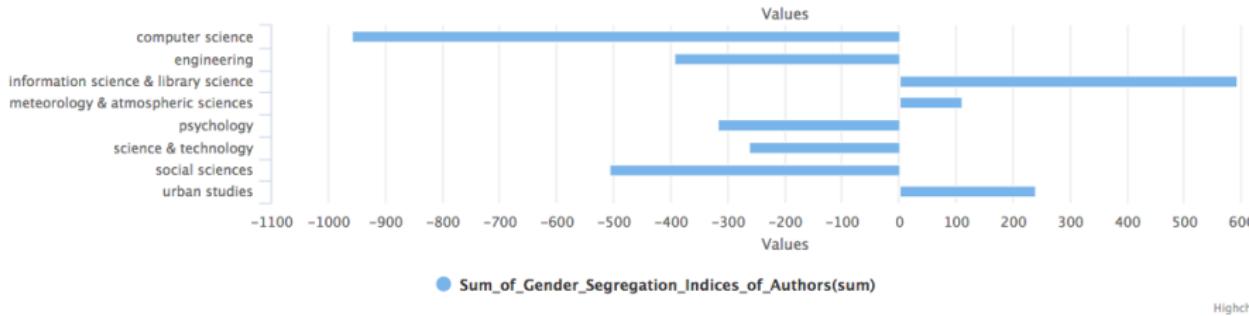
Research_Area	Number_of_Publications
arts & humanities	255
information science & library science	188
literature	185
linguistics	114
history	99
computer science	97
social sciences	63
communication	42
business & economics	25
art	22
education & educational research	21
cultural studies	20
religion	20
psychology	18
geography	17
theater	15
history & philosophy of science	15
science & technology	13
philosophy	13
archaeology	13
women's studies	13
music	12

## Number of Research Areas

FINISHED ▶ ⏪ ⏫ ⏮ 🔍



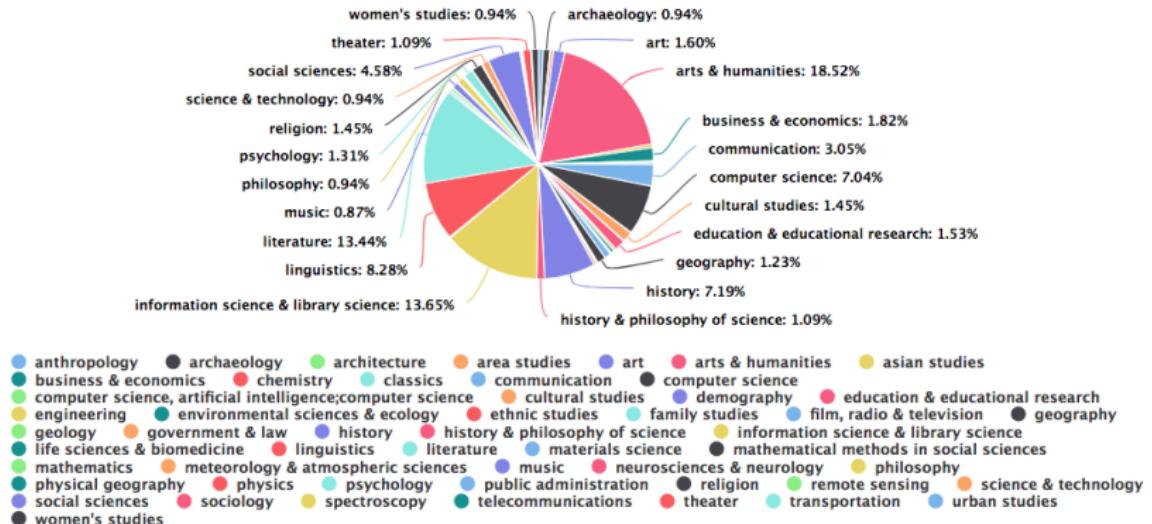
### Sum of Gender Segregation Indices of authors of publications in Top Research Areas



### Sum of Gender Segregation Indices of authors in Top Sources

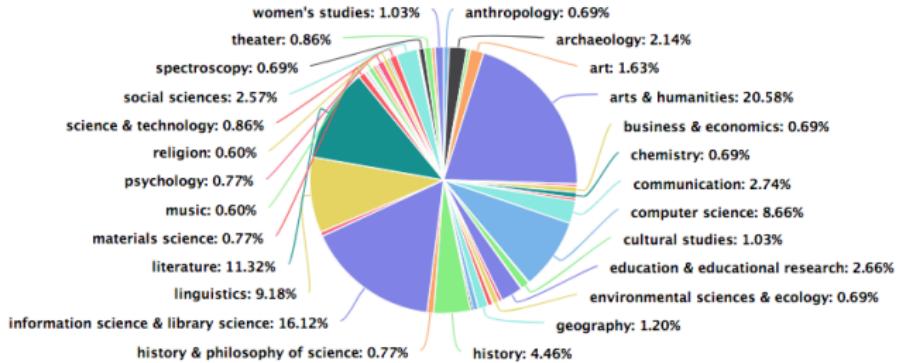


## WoS Research Areas in Digital Humanities publications 1998–2018 for female and male authors



Highcharts.com

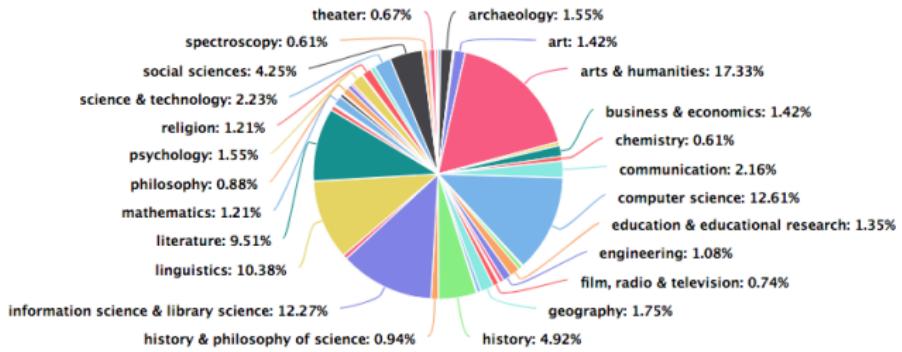
## WoS Research Areas in Digital Humanities publications 1998–2018 for female authors



- anthropology   ● archaeology   ● area studies   ● art   ● arts & humanities   ● asian studies   ● business & economics
- chemistry   ● classics   ● communication   ● computer science   ● computer science, artificial intelligence; computer science
- cultural studies   ● demography   ● education & educational research   ● engineering   ● environmental sciences & ecology
- family studies   ● film, radio & television   ● geography   ● geology   ● government & law   ● history
- history & philosophy of science   ● information science & library science   ● life sciences & biomedicine   ● linguistics   ● literature
- materials science   ● mathematical methods in social sciences   ● mathematics   ● meteorology & atmospheric sciences   ● music
- philosophy   ● physical geography   ● psychology   ● religion   ● remote sensing   ● science & technology   ● social sciences
- sociology   ● spectroscopy   ● theater   ● urban studies   ● women's studies

Highcharts.com

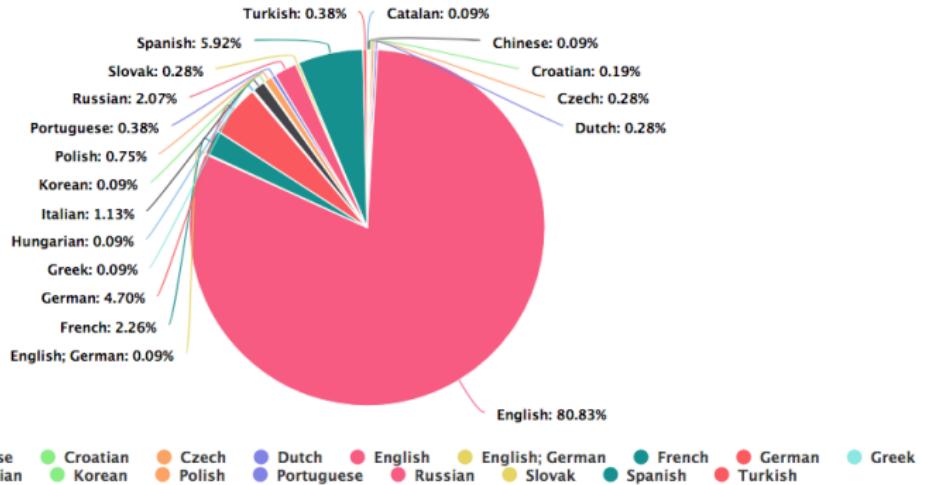
## WoS Research Areas in Digital Humanities publications 1998–2018 for male authors



- anthropology ● archaeology ● architecture ● area studies ● art ● arts & humanities ● asian studies
- business & economics ● chemistry ● communication ● computer science
- computer science, artificial intelligence; computer science ● cultural studies ● education & educational research ● engineering
- environmental sciences & ecology ● ethnic studies ● family studies ● film, radio & television ● geography ● geology
- government & law ● history ● history & philosophy of science ● information science & library science
- life sciences & biomedicine ● linguistics ● literature ● materials science ● mathematical methods in social sciences
- mathematics ● music ● neurosciences & neurology ● philosophy ● physical geography ● physics ● psychology
- public administration ● religion ● remote sensing ● science & technology ● social sciences ● sociology ● spectroscopy
- telecommunications ● theater ● transportation ● urban studies ● women's studies

Highcharts.com

## Number of Publications in Languages



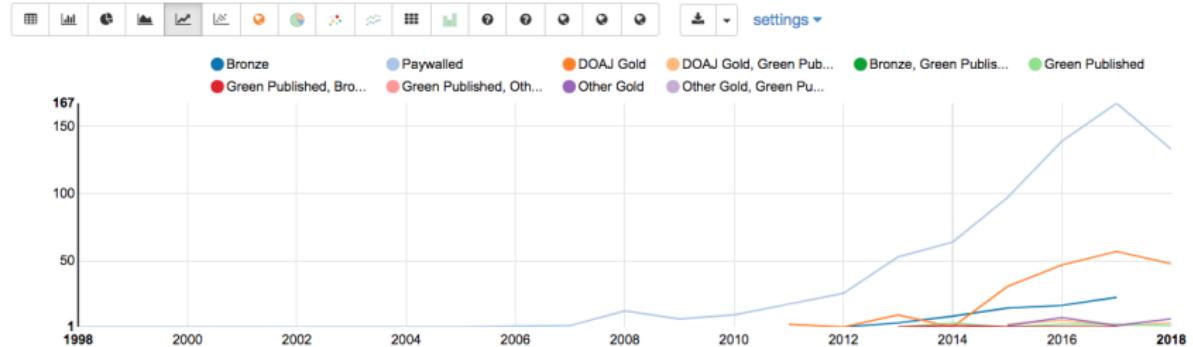
Highcharts.com

# Open Access (OA)

OA	Number_of_Publications
Paywalled	733
DOAJ Gold	198
Bronze	70
Other Gold	20
DOAJ Gold, Green Published	15
Green Published	14
Green Published, Bronze	6
Bronze, Green Published	4
Other Gold, Green Published	2
Green Published, Other Gold	2

## Number of Open Access Type of Publications per Year

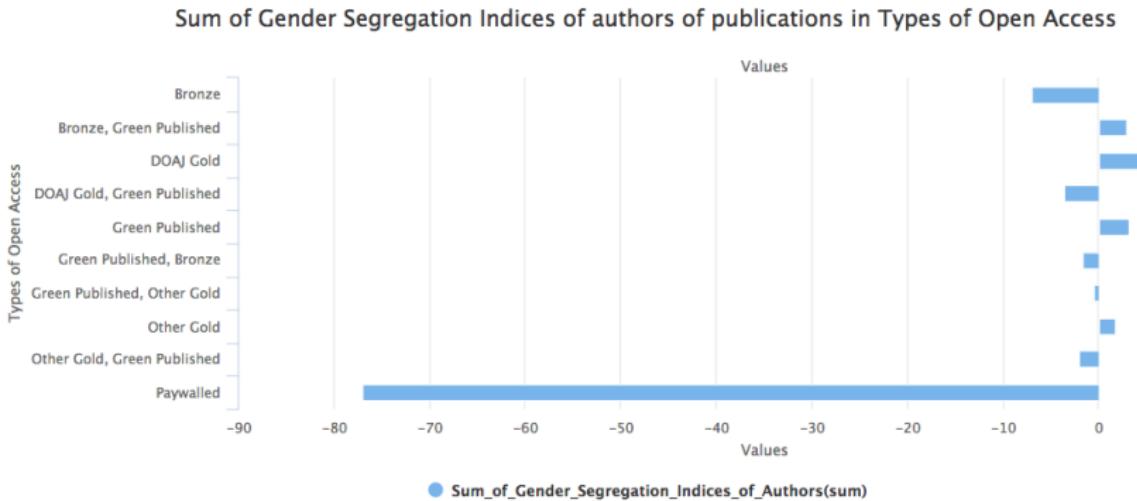
FINISHED ▶ ⌂ ☰



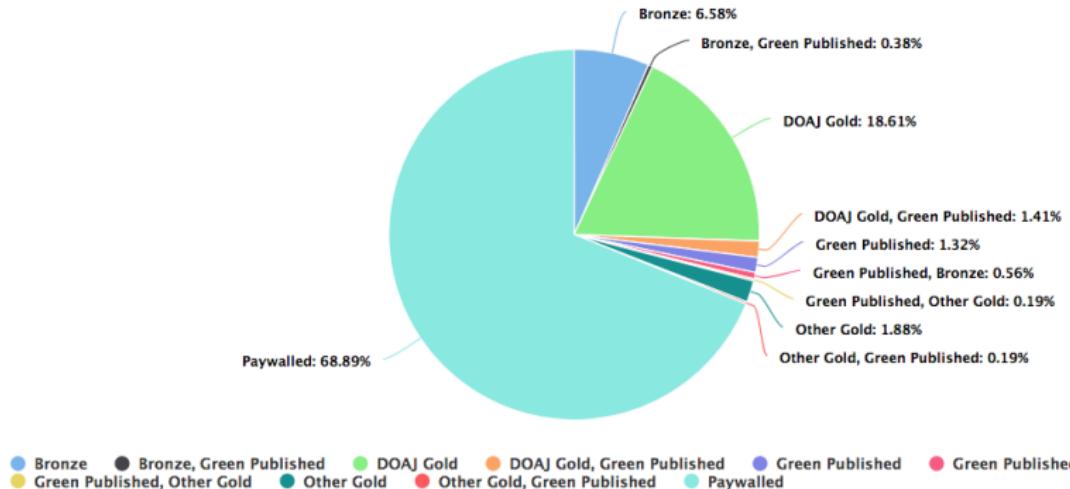
### Publications in Open Access Type by Particular Authors per Year

FINISHED ▶ 🔍 ⌂ 🔍



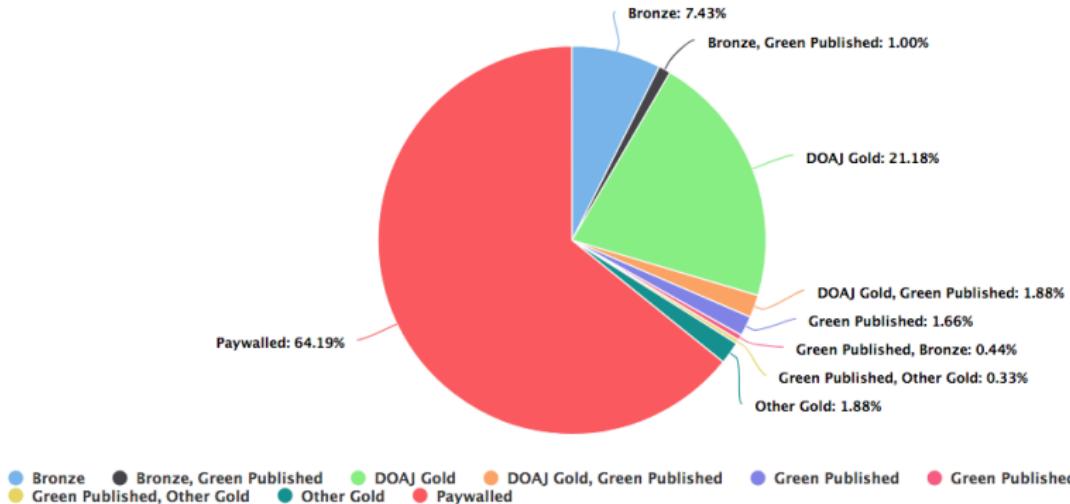


## Open Access Types of Publications in WoS Digital Humanities 1998–2018 for female and male authors



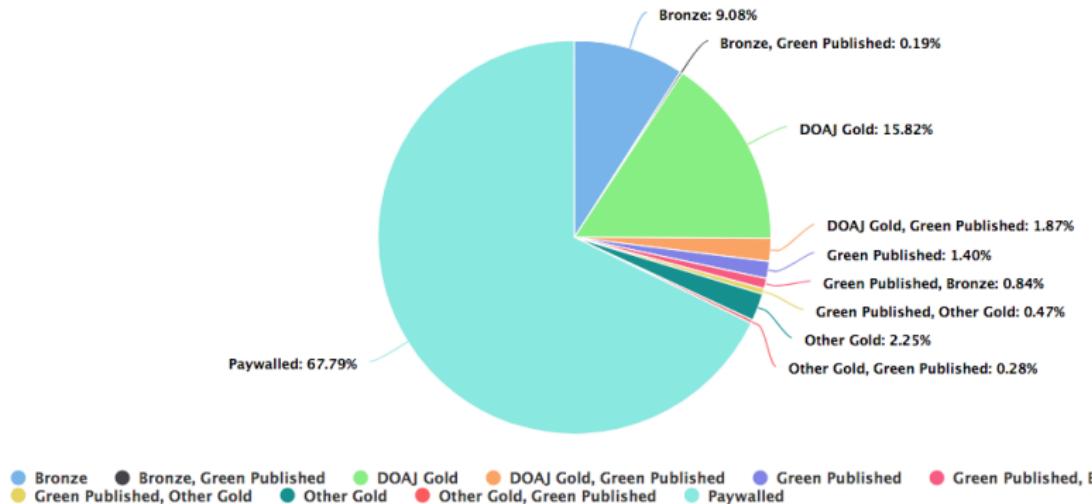
minihart.com

## Open Access Types of Publications in WoS Digital Humanities 1998–2018 for female authors



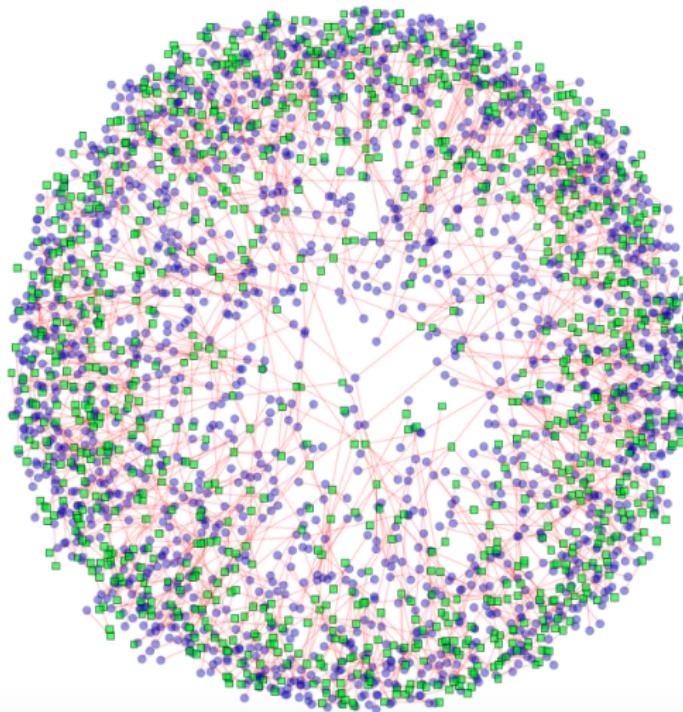
Highcharts.com

## Open Access Types of Publications in WoS Digital Humanities 1998–2018 for male authors

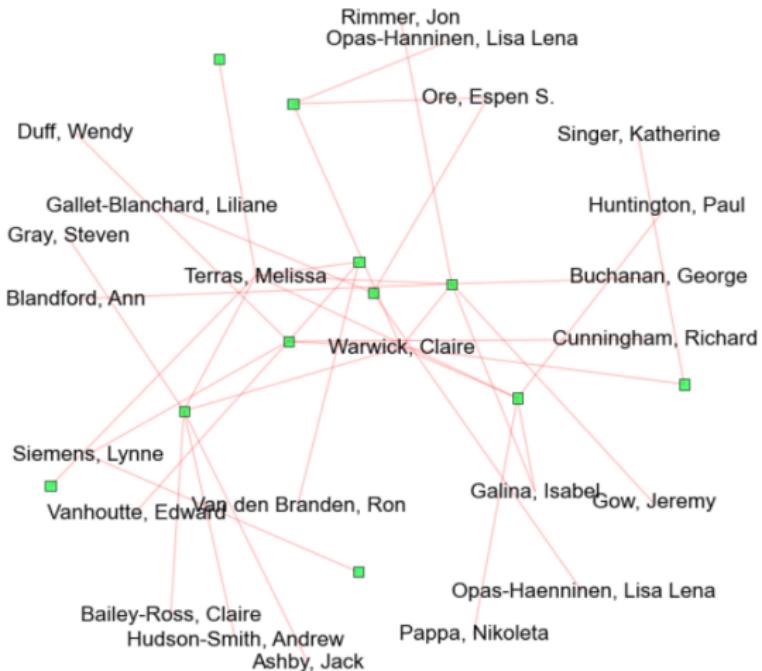


# The Bipartite Graph of Authors-Publications

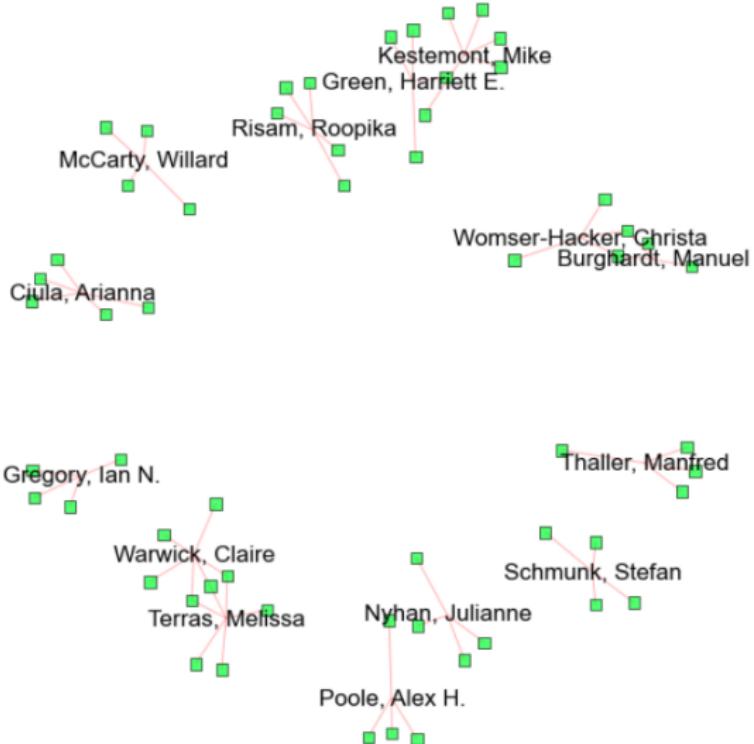
The bipartite multigraph of authors-publications in DH from 1998 to 2018  
(blue circles = 1761 authors, green squares = 1064 publications,  
red links = 1997 authors-publications associations, 866 connected components)



The largest connected component of the bipartite multigraph  
of authors-publications in DH from 1998 to 2018  
(23 authors, green squares = 11 publications,  
red links = 1997 authors-publications associations)

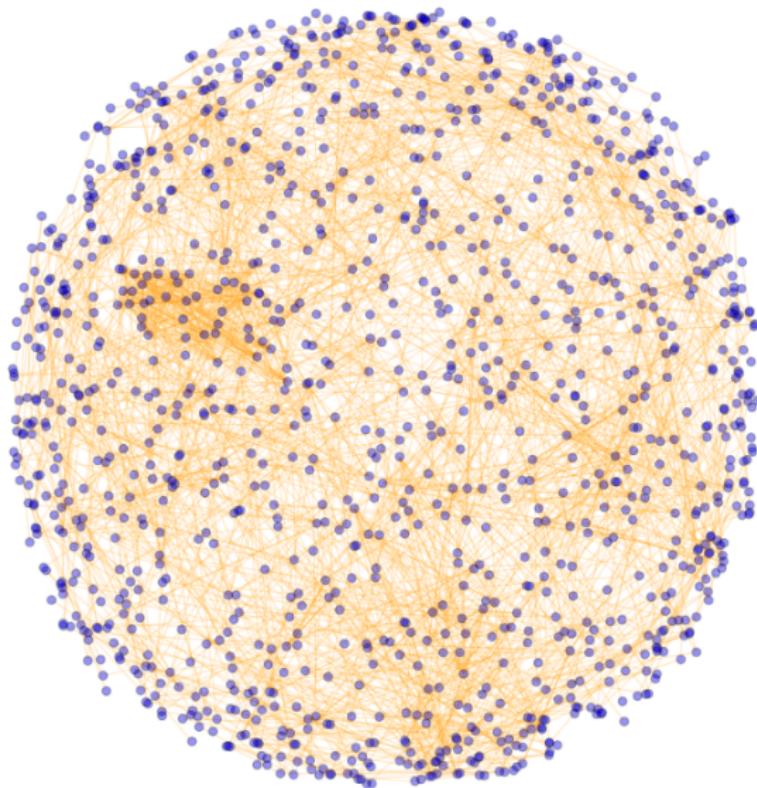


A subgraph of the bipartite multigraph of authors-publications in DH from 1998 to 2018  
(14 authors, green squares = 58 publications,  
red links = 63 authors-publications associations, 12 connected components)

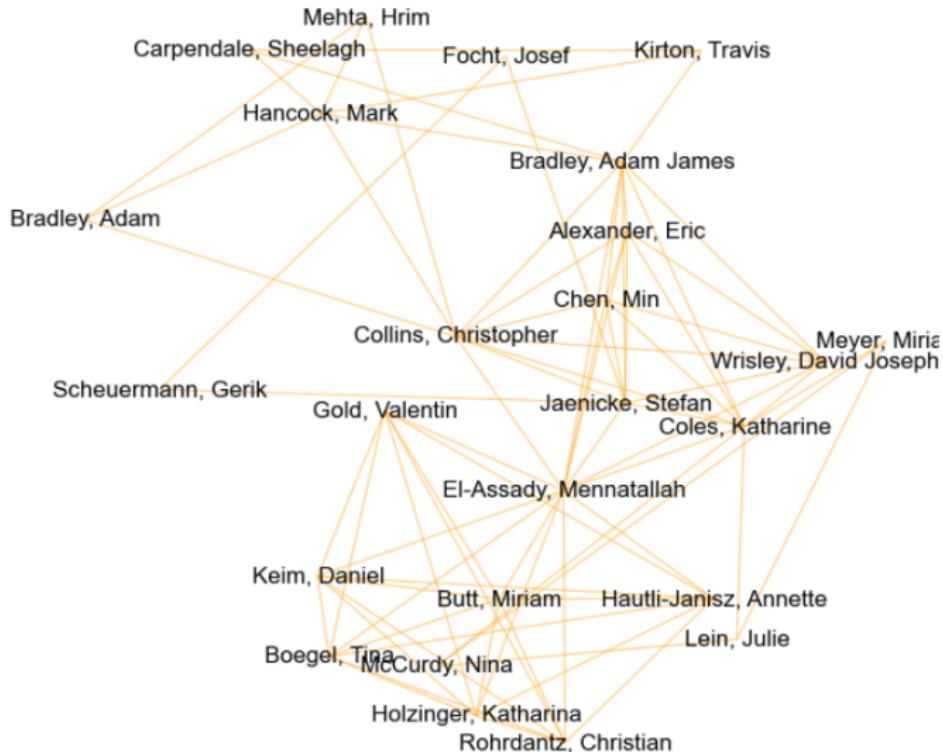


# The Publications Co-Authorship Graph

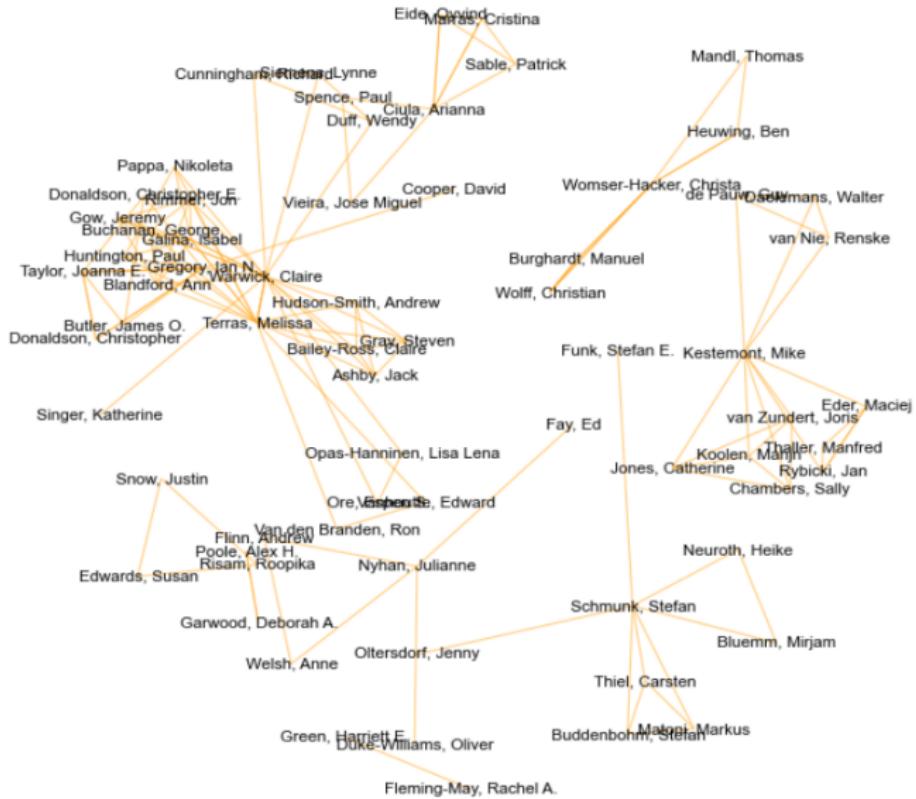
The publications co-authorship multigraph in DH from 1998 to 2018  
(blue circles = 1224 authors, orange links = 2259 publications co-authorships,  
329 connected components)



The largest connected component of  
the publications co-authorship multigraph in DH from 1998 to 2018  
(25 authors, orange links = 77 publications co-authorships)

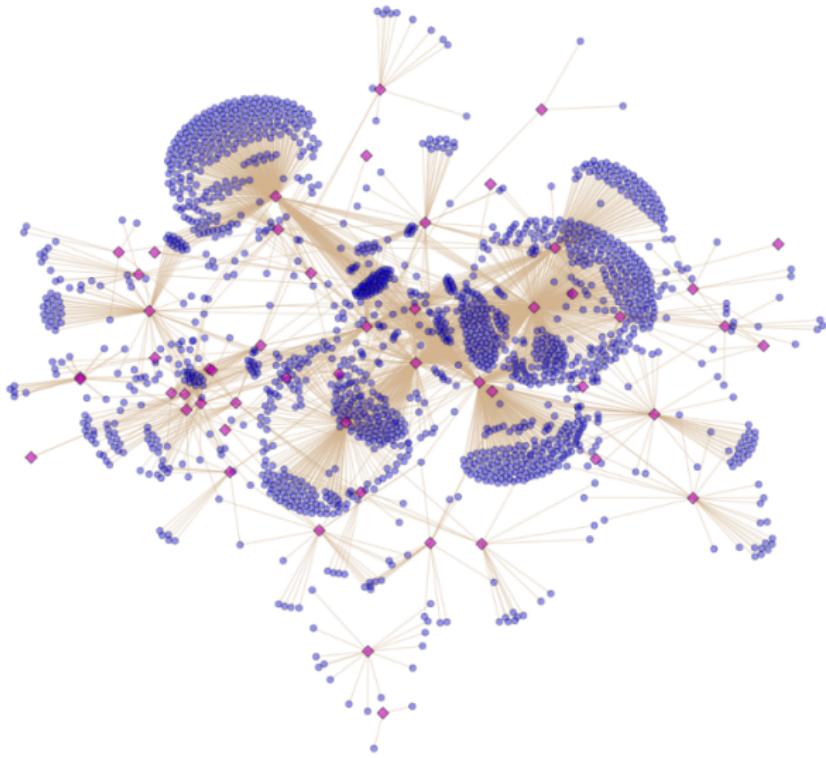


A subgraph of the publications co-authorship multigraph in DH from 1998 to 2018  
(69 authors, orange links = 138 publications co-authorships,  
10 connected components)

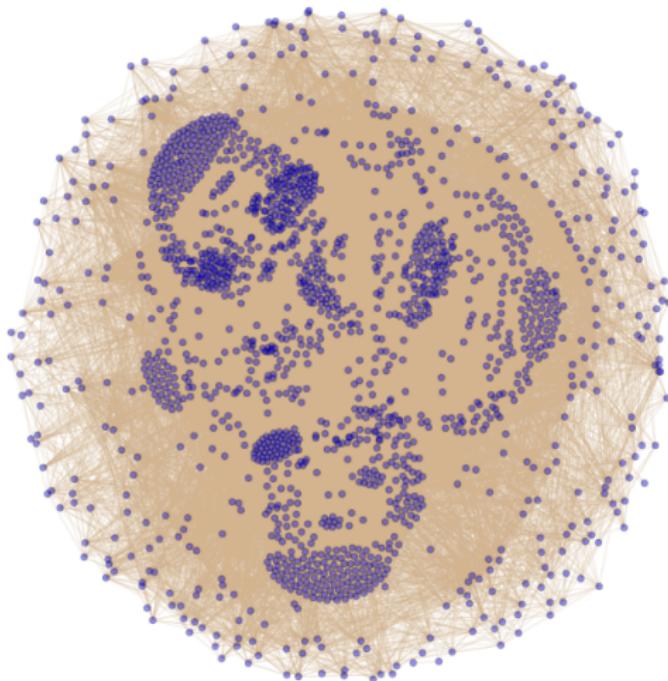


# The Research Areas Co-Authorship Graph

The bipartite multigraph of authors-research\_areas in DH from 1998 to 2018  
(blue circles = 1761 authors, magenta diamonds = 52 research areas,  
tan links = 2622 authors-research\_areas associations, 4 connected components)

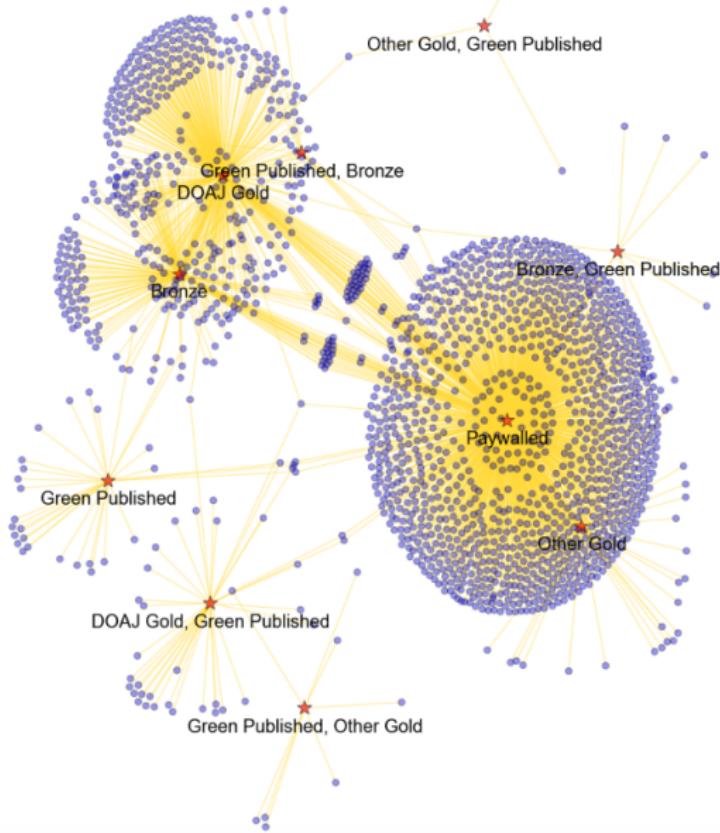


The research areas co-authorship multigraph in DH from 1998 to 2018  
(blue circles = 1761 authors, tan links = 316525 research areas co-authorships,  
4 connected components)

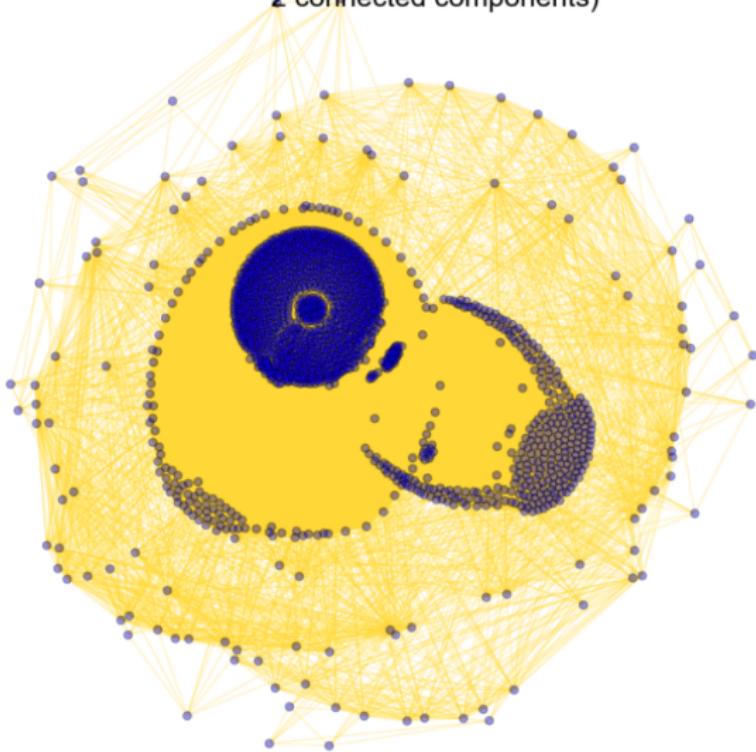


# The Open Access Types Co-Authorship Graph

The bipartite multigraph of authors-OA\_types in DH from 1998 to 2018  
(blue circles = 1761 authors, red stars = 10 Open Access types,  
gold links = 1953 authors-OA\_types associations, 2 connected components)

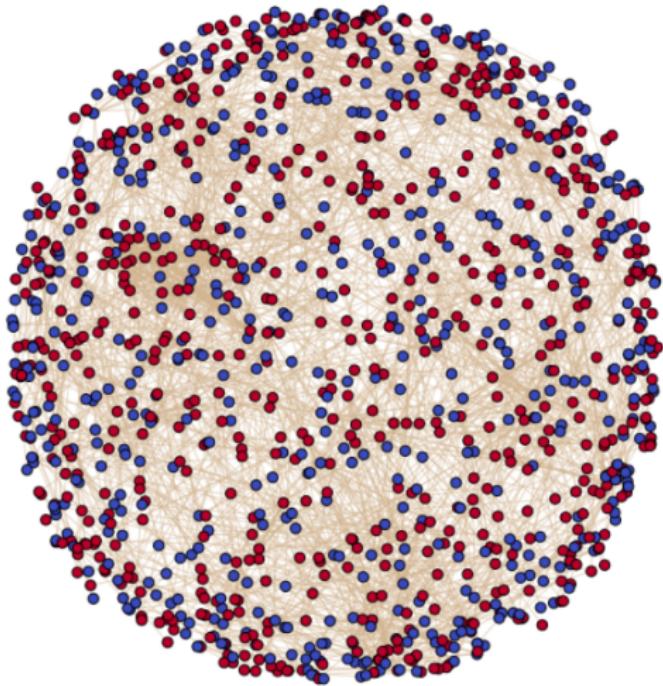


The OA types co-authorship multigraph in DH from 1998 to 2018  
(blue circles = 1761 authors, gold links = 916505 OA types co-authorships,  
2 connected components)



# **Gender Assortativity of Co-Authorship**

The publications co-authorship (weighted) graph in DH from 1998 to 2018  
with Gender Assortativity Coefficient = 0.146  
(558 dark blue female, 666 maroon male authors and 2206 tan co-authorship links)



Authors = 1224

Co-authorships = 2206

Female authors = 558 (45.59%)

Male authors = 666 (54.41%)

The male-male links are 845

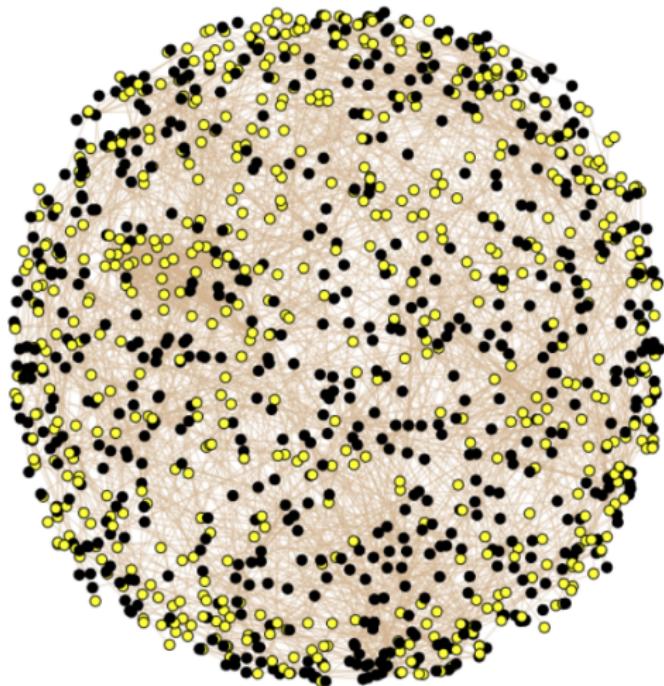
The male-female links are 912

The female-female links are 449

Gender assortativity coefficient = 0.145632981005

# **"Culture" Assortativity of Co-Authorship**

The publications co-authorships (weighted) graph in DH from 1998 to 2018  
with "Culture" Assortativity Coefficient = 0.734  
(632 dark blue sciences, 592 yellow humanities authors and 2206 tan co-authorship links)



Authors = 1224

Co-authorships = 2206

Humanities authors = 592 (48.37%)

Sciences authors = 632 (51.63%)

The sciences-sciences links are 1047

The humanities-humanities links are 868

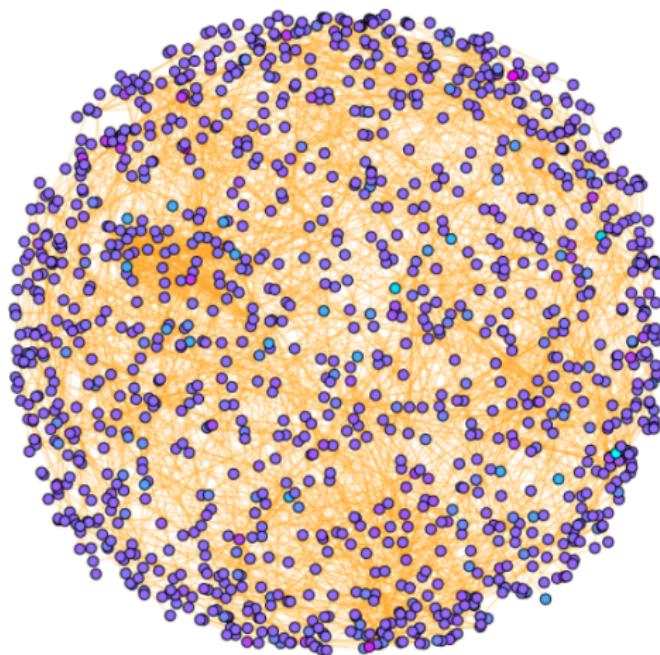
The humanities-sciences links are 291

‘‘Culture’’ assortativity coefficient =

0.734425507225

# **Open Access Assortativity of Co-Authorship**

The publications co-authorship (weighted) graph in DH from 1998 to 2018  
with Cumulative OA Type Assortativity Coefficient = 0.993  
(2206 orange co-authorship links)



-2000

-1500

-1000

-500

0

500

1000

1500

Cumulative Open Access Type (times 10)



Paywalled: -1

Bronze: 0.5

Bronze, Green Published: 0.6

Other Gold : 0.6

Green Published: 0.7

Green Published, Bronze : 0.7

Green Published, Other Gold : 0.7

Other Gold, Green Published 0.8

DOAJ Gold: 0.9

DOAJ Gold, Green Published: 1.0

Authors = 1224

Co-authorships = 2206

Cumulative OA Type Assortativity Coefficient =  
0.9930894344516341

## Conclusions

The co-authorship graph of publications on Digital Humanities from 1998 to 2018 is:

- ▶ Moderately mixed with respect to the gender of authors.
- ▶ Very segregated with respect to how authors are positioning the research areas of their publications among the “Two Cultures” (Humanities-Sciences).
- ▶ Extremely segregated with respect to the cumulative Open Access scores that authors achieve.

## So, what about Digital Humanities?

- ▶ This evidence from publications in the emerging discipline of Digital Humanities is very important since it signifies that although DH sometimes has been claimed to be a melting pot, a place of convergence or a venue in the middle of Humanities and Sciences, in reality C.P. Snow's "Two Cultures" are already reproduced inside this area which was supposed to bridge the differences between the two main disciplinary constituents of DH.
- ▶ Of course, though the popular understanding might be still that DH stands as a sort of a disciplinary reconciliation between Humanities and Sciences, what the present bibliometric study shows is that authors, when contributing to the field, tend to endorse the auspices of this zone de liaison, although they insist on keeping their segregatory disciplinary affiliations and identities.