



Is Childbearing Contagious?

Fertility and Social Interaction at the Workplace

Fertility over the Life Course

International Conference at the University of Bremen

September 13th, 2012

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Outline

1. Motivation
2. Theoretical considerations and previous research
3. Data and methods
4. Results
5. Discussion and outlook



Motivation



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Relationship social interaction and fertility

- Idea of social interaction effects on fertility features prominently in the literature (Coale & Watkins, 1986; Montgomery & Casterline, 1996; Kohler, 2001 and many more)
- We focus on one aspect of this relationship

Does social interaction at the workplace influence the timing of fertility?

- Does the probability of becoming pregnant rise after a preceding birth event of a colleague?
- The workplace is particularly interesting for at least two reasons
 - a) the *exposure* to births is likely to be much higher compared to other networks like the family or friends
 - b) colleagues (can) provide *context-specific information* that could be more relevant for fertility decisions than information from interaction partners outside this network



Theoretical considerations and previous research



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In general, what is the importance of social contacts concerning the decision whether and when to have a child?

- Several domains of daily life identified in qualitative studies (Keim et al., 2009; Bernardi, 2003)
- Four mechanisms discussed (partly following the literature concerning diffusion)
 - a) Social learning
 - b) Social pressure
 - c) Social support
 - d) Social/Emotional contagion
- Quantitative Analyses concerning the timing in different networks
 - a) Family (Lyngstad & Prskawetz, 2010; Kuziemko, 2006)
 - b) Friends (Balbo & Barban, 2012)
 - c) Workplace (Hensvik & Nilsson, 2010; Ciliberto et al., 2011)
 - Some empirical evidence for the existence of a contagion effect in different networks
 - Possible mechanisms solely discussed ex post - They are not addressed with a empirical identification strategy



Which mechanisms can drive a possible contagion effect of fertility at the workplace?

- Our study is informed by the principles of Analytical Sociology
 - This perspective considers an action as a result of a constellation of desires, beliefs and opportunities (Hedström, 2005)
- Two mechanisms seem plausible
 - a) *Belief*-based interaction
 - A colleague can serve as a *social model* that alters existing beliefs concerning the realization and outcome of a birth
 - According to the concept of self-efficacy the social model's influence rises with increasing (perceived) similarity between interaction partners (Bandura, 1994)
 - Therefore, this mechanism should operate especially between (perceived) similar colleagues
 - b) *Desire*-based interaction
 - A birth event or even a pregnancy could intensify the desire for an own child
 - This mechanism should be at work especially in cases with direct contact to the child

Which one of the two mechanisms seems more important at the workplace?

- Two reasons for belief-based interaction
 1. Similarity of the context eases relating new information to own situation
 2. Interaction between colleagues, on average, is not as frequent and intimate as the interaction between e.g. friends or family members. Thus, it seems less likely that a colleague has direct contact with another colleague's newborn. This, however, does not apply to fertility-relevant information.

Data and methods



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Data

- Linked Employer-Employee Data of the German Federal Employment Agency
 - LIAB Version 3, 1993-2007
- Allows examining the entire staff based on monthly information

Dependent variable: pregnancy

- The identification of an birth event is operationalized by *parental leave* reports
- As virtually no male employee in the data has taken parental leave, the following analysis is restricted to female co-workers
- We calculate the beginning of a first pregnancy by subtracting 9 months from the birth event

Sample restrictions

1. Female workers who were not more than 24 years of age when first observed
 2. To ensure the possibility of daily interaction, we restricted the sample to firms with not more than 150 employees
- 42,394 female employees in 7,560 firms with 363 first pregnancy events



Empirical test of a contagion effect

- *Three binary variables*: at least one female colleague within the same firm had a child within one, one to two and two to three years before the current observation (based on a second sample encompassing all female employees)
- Assessing the two proposed mechanisms with two sets of binary variables
 - To operationalize our assumption that birth events from (perceived) similar colleagues should be very important, we condition the three dummies on an **age interval** of *plus or minus two years* indicating (perceived) similarity due to age similarity
 - This additionally yields three dummies representing reference categories. They represent contagion which operates via the desires, indicating a contagion that is autonomous of perceived similarity.

Statistical model

- Discrete event time history analysis with logistic regression and an random effect at firm level
- We incorporate time dependency and personal characteristics, such as highest educational attainment, regional information on East and West Germany, migration background, earnings and occupational position
- As shown by additional analyses (not presented here), firm characteristics do not exhibit any significant effect on birth timing when personal characteristics, time and the contagion dummies are entailed



Results



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	Unconditional contagion Model 1		Conditional contagion Model 2	
	B	S.E.	B	S.E.
<i>Contagion dummies</i>				
01-12 months	.57	(.18) **	.72	(.22) **
12-24 months	.37	(.19) †	.21	(.27)
24-36 months	.16	(.22)	.39	(.27)
01-12 months			.45	(.21) *
12-24 months			.47	(.22) *
24-36 months			-.06	(.30)
<i>Time dependency</i>	Yes		Yes	
<i>Personal characteristics</i>	Yes		Yes	
Constant	-9.50	(.59) ***	-9.47	(.59) ***
Person months	965,233		965,233	
Pregnancy events	338		338	
LL	-2792.11		-2790.54	
$\sigma_{\downarrow u}$.88	(.13)	.88	(.11)
ρ	.19	(.04) ***	.19	(.04) ***
χ^2	30.09		29.10	

Note: LIAB v3, own calculations. Female employees: 35,294. Number of clusters: 6,365.

† p < 0.1. * p < 0.05. ** p < 0.01. *** p < 0.001.

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Discussion and outlook



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Discussion

- Main contribution
 - Empirical identification of a contagion effect of fertility at the workplace in Germany
- Additional contribution
 - We hypothesized the belief-based interaction to be more important. As seen in the results, it is the most pronounced (at least in the first year).
 - Nevertheless, it becomes evident that not only the births from age-near colleagues are influential but those of other colleagues, too. We interpret this as empirical evidence for the existence of both belief- and desire-based contagion.
- Limits
 - Operationalization of (perceived) similarity
 - Similarity seems to be a complex interplay of different factors. However, substantive conclusions did not change with other operationalizations like earnings
 - Subject of study is the transition to a first pregnancy



Outlook for future research

- The mechanisms which operate have to be analyzed in more detail with more suitable data.
- A **simultaneous study** of networks with different sizes and quality of their relationship would be desirable to examine which social contacts are most contagious and which network is the most contagious quantitatively. Contagion crossing borders of networks could also be a very interesting topic.



Appendix



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Tabelle 1: Deskriptive Statistiken (N = 42.394 Frauen)

	Mittelwert	Standard- abweichung	Min.	Max.	Personenmonate
Schwangerschaft (/100)	,03	1,81	0	1	1.104.231
<i>Ansteckungsindikatoren</i>					
Gesamt ^a					
01-12 Monate	,05	,23	0	1	1.104.231
12-24 Monate	,04	,19	0	1	1.104.231
24-36 Monate	,02	,15	0	1	1.104.231
Altersähnlichkeit ^b					
01-12 Monate	,02	,14	0	1	1.104.231
12-24 Monate	,01	,12	0	1	1.104.231
24-36 Monate	,01	,10	0	1	1.104.231
Altersunähnlichkeit ^c					
01-12 Monate	,03	,18	0	1	1.104.231
12-24 Monate	,02	,15	0	1	1.104.231
24-36 Monate	,01	,12	0	1	1.104.231
<i>Kontrollvariablen</i>					
Prozesszeit ^d	118,15	61,69	1	287	1.104.231
Lohn ^e	39,77	28,48	0	2427,36	1.098.927
Ostdeutsche (Ref: Westdeutsche)	,51	,49	0	1	1.104.231
Migrantin (Ref: Deutsche)	,03	,16	0	1	1.098.507
Bildung (Ref: Hoch) ^f					
Gering	,85	,35	0	1	965.612
Mittel	,10	,30	0	1	965.612
Berufliche Stellung ^g					
In Ausbildung	,26	,44	0	1	1.098.564
In Teilzeit	,22	,41	0	1	1.098.564

Quelle: UAB Version 3 (1993-2007), eigene Berechnungen.

Anmerkung: Datenaufbereitung auf Monatsbasis. ^a Mindestens eine Kollegin hat im jeweiligen Intervall zuvor ein Kind bekommen. ^b Mindestens eine Kollegin hat im jeweiligen Intervall zuvor ein Kind bekommen und war zu diesem Zeitpunkt nicht mehr als zwei Jahre älter oder jünger als die Frau im betrachteten Monat. ^c Mindestens eine Kollegin hat im jeweiligen Intervall zuvor ein Kind bekommen und war zu diesem Zeitpunkt mehr als zwei Jahre älter oder jünger als die Frau im betrachteten Monat. ^d Prozesszeit beginnt im Alter 15 und endet bei Erstschwangerschaft mit einem Ereignis oder im letzten Beobachtungsmontat mit einer Rechtszensierung. ^e Tagesentgelt in Euro. ^f Gering = Mittlere Reife mit/ohne Berufsausbildung; Mittel = (Fach-)Hochschulreife mit/ohne Berufsausbildung; Hoch = (Fach-)Hochschulabschluss. ^g Teilzeit = Teilzeitanstellung, die auch mehr als die Hälfte der Vollarbeitszeit betragen kann. Referenz: Vollzeit beschäftigte Arbeiter oder Angestellte, die sich nicht in Ausbildung befinden.



Tabelle 2: Diskrete Hazardratenmodelle (N = 35.294 Frauen)

	Unbedingte Ansteckung Modell 1		Bedingte Ansteckung Modell 2	
	B	S.E.	B	S.E.
<i>Ansteckungsindikatoren</i>				
01-12 Monate	,57	(,18) **	,72	(,22) **
12-24 Monate	,37	(,19) †	,21	(,27)
24-36 Monate	,16	(,22)	,39	(,27)
01-12 Monate			,45	(,21) *
12-24 Monate			,47	(,22) *
24-36 Monate			-,06	(,30)
<i>Zeitinformationen</i>				
Prozesszeit (/10)	,29	(,06) ***	,29	(,06) ***
Prozesszeit ² (/1000)	-,09	(,02) ***	-,09	(,02) ***
Jahres-Dummies	,Ja		,Ja	
<i>Personencharakteristika</i>				
Ostdeutsche	,35	(,14) *	,34	(,14) *
Migrantin	-1,22	(,71) †	-1,22	(,72) †
Lohn (/10)	-,07	(,02) **	-,07	(,02) **
<i>Schulische Bildung</i>				
Gering	-,13	(,26)	-,13	(,26)
Mittel	-,29	(,32)	-,29	(,32)
<i>Berufliche Stellung</i>				
In Ausbildung	-1,21	(,28) ***	-1,22	(,28) ***
In Teilzeit	-,50	(,16) **	-,50	(,16) **
Konstante	-9,50	(,59) ***	-9,47	(,59) ***
Personenmonate	965.233		965.233	
Schwangerschafts-ereignisse	338		338	
Log Likelihood	-2792,11		-2790,54	
	,88	(,13)	,88	(,11)
ρ	,19	(,04) ***	,19	(,04) ***
χ^2	30,09		29,10	

Anmerkung: LIAB Version 3 (1993-2007), eigene Berechnungen.

Für Erläuterungen zu den Variablen und deren Aufbereitung, siehe Tabelle 1. Betriebscluster: 6365. † p < 0,1; * p < 0,05; ** p < 0,01; *** p <

0,001

