International Review of Entrepreneurship, Article #1719, 22(3): pp. 257-282.

A Systematic Analysis of Risk Attitudes Across Partners in Entrepreneurial Double-Earner Households

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Abstract. The willingness to take risks is one of the overall best predictors of individual self-employment. Most papers compare the willingness to take risks of randomly selected paid employees and self-employed. The contribution of this explorative paper is to revisit the view that risk-taking is mainly an attribute of the self-employed person by explicitly considering that the self-employed and household members usually form an economic unit with blurred boundaries between the business and the private sphere. Specifically, we examine the distribution of risk attitudes of partners within double-earner entrepreneurial households with the German Socio-Economic Panel. Our findings suggest that the more risk-averse partner is self-employed in almost three in ten entrepreneurial households. This finding is not well documented in theory and empirical research. Also, households with relatively risk-averse self-employed individuals differ in several ways from households where the self-employed are relatively more risk-tolerant. Moreover, the distribution of risk attitudes of partners might change over time. Promising avenues for further research are discussed.

JEL-Classification: L26

Keywords: entrepreneurial households, risk aversion, risk tolerance, self-employment

Acknowledgement: The author declares that he has no conflict of interest. Thanks to Teita Bijedic and the participants at the 39th EBES conference in Rome for helpful comments and suggestions.

1. Introduction

Almost every decision in life is associated with uncertainty. Similar applies to self-employment and entrepreneurship, where outcomes are uncertain. Therefore, becoming self-employed is an inherently risky decision compared to employer-employee relationships where formal contracts reduce uncertainty. Indeed, a magnitude of papers link risk attitudes to self-employment. Theoretical papers suggest that less risk-averse individuals become entrepreneurs (Kihlstrom and

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Laffont, 1979). Central assumptions were "that all individuals are equal in their abilities to perform entrepreneurial as well as normal labor functions" and that "[t]hey differ only in their willingness to bear risks" (Kihlstrom and Laffont, 1979, p. 746). Although modern theoretical studies are less restrictive, the willingness to take risks remains essential for the theories describing the propensity to become self-employed (Parker, 1997). Finally, note that some studies are suggestive that risk-averse individuals might opt for self-employment rather than paid employment (Hsieh et al., 2017; Parker, 1997; Xu and Ruef, 2004). However, large-scale empirical studies usually confirmed that the self-employed tend to be less risk-averse than employees (Caliendo et al., 2009; Ekelund et al., 2005; Skriabikova et al., 2014).[2]

The private and the business spheres can hardly be considered separately in entrepreneurial households. Becker (1974) suggested that the decisions of household members cannot be considered in isolation from each other, and that the allocation of resources is embedded in a bargaining process. Hence, households collectively decide about potential entrepreneurial actions. Furthermore, family issues affect strategic decision-making, and the business sphere also impacts family issues (Aldrich and Cliff, 2003; Bettinelli et al., 2014; Carter et al., 2017; Mathias and Wang, 2023). In other words, decisions, behavior, risk attitudes, perceptions, and norms can be expected to be influenced by partners within households.

The literature so far examined the difference in risk attitudes of randomly selected paid employees and self-employed. In this paper, we examine the willingness to take risks in the context of double-earner households because of the blurred boundaries between business and private spheres within households (Aldrich and Cliff, 2003; Alsos et al., 2014a, 2014b; Becker, 1965; Bettinelli et al., 2014; Carter, 2011; Carter et al., 2017; Jennings and McDougald, 2007; Parasuraman et al., 1996). Specifically, this study differs from existing ones by explicitly investigating the differences in the risk attitudes of partners within entrepreneurial households because partners usually interact, share norms, and jointly maximize utility.[3] Therefore, our study differs from others by favoring comparisons between the self-employed and their partners over comparisons between the self-employed and randomly selected paid employees.

The main objective of this paper is to revisit the stylized facts about risk attitudes and entrepreneurship by explicitly considering personal interactions and fluid boundaries between private and business spheres. Specifically, we ask whether the more risk-tolerant partner is self-employed and thus shift the focus to the distribution of risk attitudes across partners within households. In this regard,

2. Note that Hsieh et al. (2017, p. 288) discuss and name empirical studies that revealed no differences between entrepreneurs and non-entrepreneurs.
3. In this study, households consist of two partners that are matched by unique partner identification numbers. Entrepreneurial households are defined as households with at least one self-employed person. See section 2 for details.

we define specific household types by explicitly considering the differential in risk attitudes between partners. We then analyze the distinct characteristics of these different household types to examine the nature of the differential in willingness to take risks between the self-employed and non-self-employed members of the household. Finally, we explore the stability of the distribution of risk attitudes across partners in entrepreneurial households over time. A major difference between existing papers, which compare randomly selected paid employees with self-employed individuals, is that we consider household members who interact directly with and influence the self-employed to gain insights into whether the self-employed are less risk-averse than their partners. In this regard, we go beyond the analysis of average values (cf. Newbert et al., 2022) and contribute to the theoretical controversy about whether self-employed are less risk-averse (e.g., Kihlstrom and Laffont, 1979) or more risk-averse (cf. Hsieh et al., 2017; Parker, 1997) than paid employees.

This study is based on a large German household survey covering the years from 2004 to 2019. The data allow linking partners via unique identifiers, enabling analyzing their responses within the household context. Furthermore, the survey consists of an individual and a household questionnaire, which enables the analysis of characteristics at the individual as well as household level. Our analysis shows that the less risk-averse partner is self-employed in most entrepreneurial households. This finding is consistent with the existing literature. However, we also document that in three in ten entrepreneurial households, the more risk-averse individual is self-employed, while the more risk-tolerant partner is in an employer-employee relationship. Besides, risk tolerance is identical across partners in one in seven entrepreneurial households. We then document differences across these distinctively different entrepreneurial households. This heterogeneity is not well reflected in theory and empirical studies, which largely focus on average effects. We therefore discuss promising avenues for further research to improve our understanding of entrepreneurial behavior.

2. Data

We use the German Socio-Economic Panel — version 36 (SOEP, DOI: 10.5684/soep.core.v36eu). The SOEP is a longitudinal survey of more than 10 thousand private households in Germany that is provided by the German Institute for Economic Research (DIW) Berlin. Basic data characteristics are described in Wagner et al. (2007) and Goebel et al. (2018). The SOEP contains information on demography, education, employment, and the household. Interviewers try to interview all members of a given survey household aged 12 years or older. In addition, one person is asked to answer the household questionnaire, which covers information on housing or different sources of income.[4] This data set is

highly adequate for our purpose because it allows the analysis of individual and household characteristics.

The SOEP contains a partner indicator, which allows matching partners.[5] The unique partner identifier is utilized to match the partners and to identify households, where each household consists of two partners. The SOEP also documents the occupation of individuals, which enables the identification of individuals who already opted for self-employment or paid employment.[6] We define households with at least one self-employed individual as entrepreneurial, while non-entrepreneurial households comprise two partners in employer-employee relationships. The most central variable is the individual willingness to take risks, which is measured on an 11-item Likert scale ranging from 0 (not willing to take risks) to 10 (fully willing to take risks)[7] and is applied to describe the distribution of risk attitudes within households.

The final sample is restricted to households with partners (married or non-married) where personal identifiers can be matched. Note that we exclude self-employed farmers and agricultural workers from our analysis. In addition, we only examine households where risk attitudes and occupations are reported. Following the literature on comparisons between self-employed individuals and paid employees, we also restrict the sample to households with two employed individuals. Individuals are thus either self-employed or employees (working in the family business, white-collar employees, blue-collar workers, or civil servants). Finally, we imposed age restrictions so that households are only included if both partners are aged between 18 and 64.

3. Results

The Distribution of Risk Attitudes in Entrepreneurial Double-Earner Households

So far, existing studies compare the risk attitudes of randomly selected paid employees and self-employed individuals but lack a systematic analysis of the distribution of risk attitudes of individuals who usually interact with each other

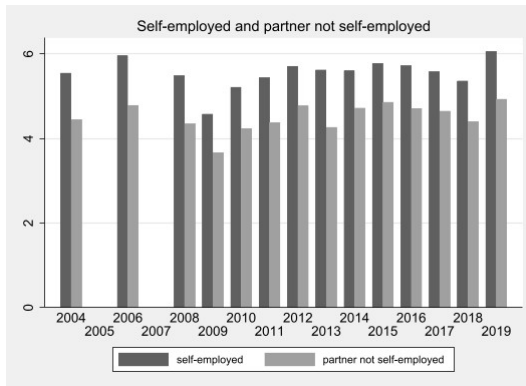
4. Cf. www.diw.de/sixcms/detail.php?id=diw_01.c.814095.en, accessed on Apr. 30, 2024.
5. According to the detailed variable description on paneldata.org (https://paneldata.org/soep-core/datasets/ppathl/parid, accessed on Apr. 30, 2024), the variable *parid* has "the purpose of defining couples in SOEP households and thus to make possible analyses on the dyadic level. [...] In unclear cases, due to temporal non-response for instance, we also consider longitudinal information from previous and prospective waves. Moreover, PARID is self-consistent between two individuals. For analyses of partner relationships, this information can be used to link all persons with their respective partners, and all information on both partners can also be stored in a common dataset."
6. This study therefore follows existing studies that compare self-employed with paid employees. Civil servants are considered to be in an employer-employee relationship.
7. Original question: Are you generally a person who is willing to take risks or do you try to avoid taking risks?

and share values and norms. We, therefore, ask whether the self-employed are always less risk-averse than their partners, who are in employer-employee relationships. The self-employed exhibit an average willingness to take risks of about 5.564, while the average risk attitude of paid employees is 4.538 on a Likert scale ranging from 0 (not willing to take risks) to 10 (fully willing to take risks) (see Table 1, first line). Therefore, the self-employed seem not to be risk-friendly but, on average, tend to be less risk-averse than the paid employees, which corroborates previous findings (cf. Hsieh et al., 2017, p. 288). The risk differential is significant, independent of the occupation of the partner. On average, across our dataset, the willingness to take risks among the self-employed is 22.6% higher when compared to their non-self-employed partners.[8]

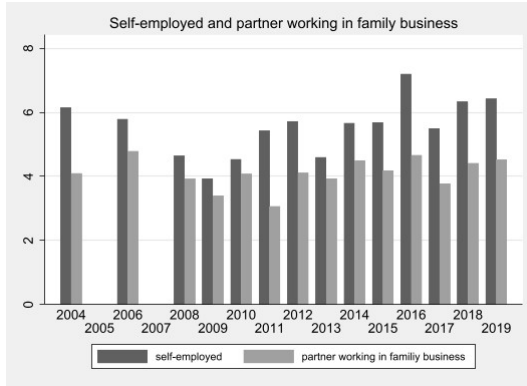
Table 1: Partner-specific average willingness to take risks in households with self-employed

Household	N	Partner 1 (self-employed)	Partner 2	T-test (two-sided, p-value)
Self-employed & partner not self-employed	7,740	5.564	4.538	0.000
Self-employed & partner working in family business	237	5.591	4.152	0.000
Self-employed & partner white-collar employee	5,810	5.661	4.577	0.000
Self-employed & partner blue-collar worker	983	5.170	4.472	0.000
Self-employed & partner civil servant	710	5.308	4.442	0.000

Figure 1: Partner-specific average willingness to take risks in households with self-employed



8. The average willingness to take risks among self-employed amounts to 5.564 in households with one self-employed individual. The corresponding value among the not self-employed partners is equal to 4.538.
The relative difference is calculated as follows: $\frac{5.564 - 4.538}{4.538} \times 100\% = \frac{1.026}{4.538} \times 100\% = 22.6$.


Self-employed and partner working in family business
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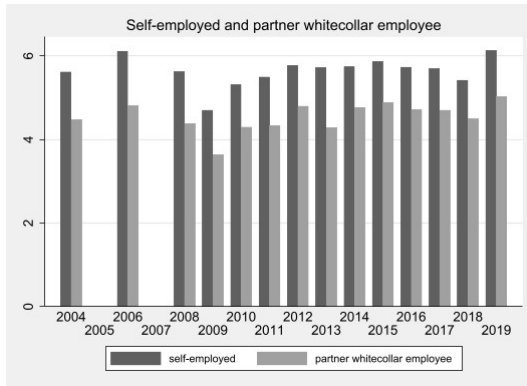
self-employed
partner working in familiy business


Self-employed and partner whitecollar employee
0
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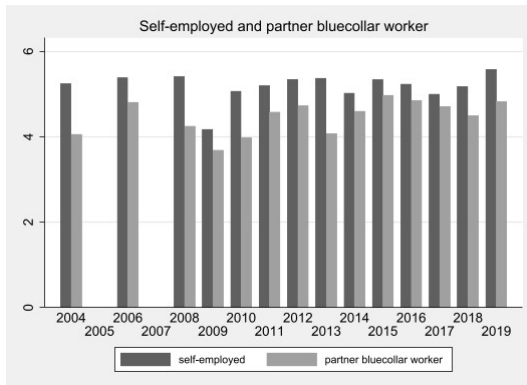
self-employed
partner whitecollar employee


Self-employed and partner bluecollar worker
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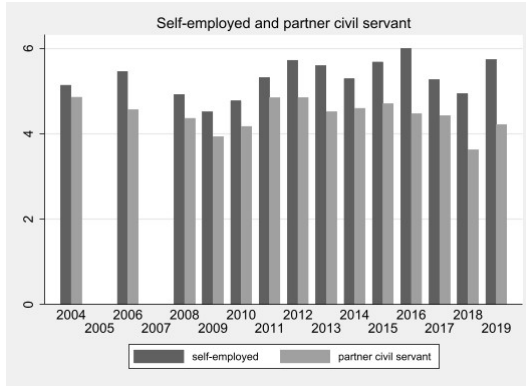
self-employed
partner bluecollar worker



No data available for the years 2005 and 2007.
Number of households
Self-employed and partner not self-employed: 7,740
Self-employed and partner working in family business: 237
Self-employed and partner white-collar employee: 5,810
Self-employed and partner blue-collar worker: 983
Self-employed and partner civil servant: 710

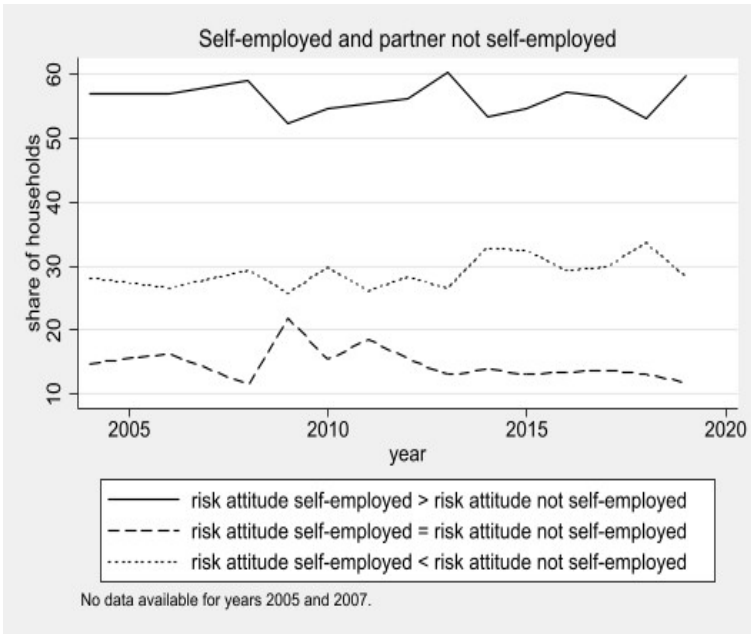
The significant differences in average risk attitudes across partners within entrepreneurial households are persistent over time (see Figure 1), which lends further credit to the literature showing that the self-employed are less risk-averse than employees.

Although the willingness to take risks is, on average, higher among the self-employed, one might consider that the more risk-averse partner starts a business (cf. Hsieh et al., 2017; Parker, 1997; Xu and Ruef, 2004). For example, Hsieh et al. (2017) suggest that risk-averse individuals opt to invest in a balanced skill profile, which makes them more likely to become entrepreneurs (cf. Lazear, 2004, 2005). Xu and Ruef (2004) discuss risk aversion from the perspective of investment choices and discuss that nascent entrepreneurs are more risk-averse than non-entrepreneurs. Therefore, we distinguish households by the distribution of risk attitudes between partners and define distinct household types. The first household type describes households where the less risk-averse partner is self-employed (*type 1*). In the second type of household, both partners report identical risk attitudes (*type 2*), while in the third type of household, the self-employed are more risk-averse than the partners (*type 3*). In line with the existing literature, Table 2 shows that in most entrepreneurial households (56.1%), the willingness to take risks of the self-employed exceeds the one of the not self-employed partners. This pattern is persistent over time (see Figure 2). However, this share is surprisingly low according to the clear-cut implications presented in prior research about the effects of individual risk attitudes on self-employment. Regression to the mean thus conceals a substantial degree of heterogeneity.

Table 2: Share of households by risk attitudes of partners

Household	N	Willingness to take risks: self-employed > partner (type 1)	self-employed = partner (type 2)	self-employed < partner (type 3)
Self-employed & partner not self-employed	7,740	56.1%	14.7%	29.2%
Self-employed & partner working in family business	237	63.7%	11.0%	25.3%
Self-employed & partner white-collar employee	5,810	56.9%	14.4%	28.7%
Self-employed & partner blue-collar worker	983	51.9%	16.2%	31.9%
Self-employed & partner civil servant	710	52.5%	16.1%	31.4%

Figure 2: Share of households by risk attitudes of partners over time



No data available for the years 2005 and 2007.
Number of observations: 7,740.

In 14.7% of households, partners exhibit identical risk attitudes. In three in ten entrepreneurial households, the self-employed reported a lower willingness to take risks than the not self-employed partner (29.2%). Except for the year 2009, where the share of entrepreneurial households with identical risk attitudes across partners exceeded 20% (outlier), there is no clear trend in the distribution of the three presented types of entrepreneurial households, which is suggestive that the distribution of household types over time is relatively stable (see Figure 2).

In households where the self-employed reported a higher willingness to take risks, the not self-employed partner reported a 3.150 points lower risk attitude (Table 3). This finding aligns with the literature about risk preferences and self-employment because the less risk-averse individual became self-employed. Regression analysis reveals that the risk differential between partners is higher in households with higher total household net income and increases with educational differences between partners but is lower for owners of dwellings.[9] In type 3 households, the self-employed reported a 2.536 points lower risk attitude than the non-entrepreneurial partner. This differential is smaller if the self-employed achieved a higher educational level than the partner and is larger the higher the wages of the paid employee in the household. Also, note that the median values point towards a 2-point lower willingness to take risks reported by the self-employed individuals in these households. This difference is significant and not consistent with the conventional results presented in the literature.

Table 3: Average willingness to take risks in entrepreneurial households by household-specific risk attitudes

Willingness to take risks	N	self-employed	partner	difference
Self-employed > not self-employed (Type 1)	4,342	6.709 (7)	3.559 (3)	3.150
Self-employed = not self-employed (Type 2)	1,136	4.952 (5)	4.952 (5)	0.000
Self-employed < not self-employed (Type 3)	2,262	3.673 (4)	6.209 (6)	-2.536

Median values (in parentheses).

The results presented in Table 3 indicate a qualitatively low value for the willingness to take risks of the self-employed in type 3 households, suggesting that some self-employed can be classified as risk-averse — even compared to paid employees (cf. Table 1). Although empirical studies show that the self-employed are, on average, less risk-averse than employees (Dohmen et al., 2011; Skriabikova et al., 2014), we encourage a closer look at the distribution of risk attitudes to gather a deeper understanding of self-employment and entrepreneurial activities.

Characteristics of Entrepreneurial Households under Consideration of the Distribution of Risk Attitudes

So far, the result that the more risk-averse person within a household becomes self-employed is not yet well documented in the literature and needs further examination. We, therefore, compare individual and household characteristics across household types (Table 4). The majority of self-employed in type 1 households have employees. In household types 2 and 3, solo self-employment is

9. This regression analysis includes the identical set of variables as in Table 5. The results are available upon request.

more common than self-employment with employees, which indicates that risk attitudes translate into growth ambitions or firm growth. Partners in type 2 and 3 households are more frequently civil servants and blue-collar workers than in type 1 households. The share of family workers is highest among type 1 households, which aligns with the result that employers are most common in these households.

Table 4: Individual and household characteristics under consideration of individual risk attitudes

Characteristics	N	Self-employed	Partner
		Mean	
Type 1: Willingness to take risks self-employed > not self-employed partner			
Solo self-employed*	4,342	0.478	—
Self-employed with employees*	4,342	0.522	—
Working in family business	4,342	—	0.035
White-collar employee	4,342	—	0.762
Blue-collar worker	4,342	—	0.117
Civil servant	4,342	—	0.086
Full-time employed*[a]	3,751	0.756	
	3,904		0.498
Part-time employed*[a]	3,751	0.244	
	3,904		0.502
Labor income	4,342	2,612.344	1,688.453
Household labor income	4,342	4,300.797	
Total household net income	4,079	4,870.116	
Rental income*	4,327	0.282	
Owner of the dwelling*	4,342	0.682	
Savings at the end of month*[b]	4,286	0.717	
Partners married	4,33	0.848	
Children under 16 years in household*	4,339	0.510	
Male*	4,342	0.761	0.240
Age([20;64])	4,342	46.750	45.290
Difference in education*[c]	4,278	0.478	
Self-employed higher qualified*	4,278	0.244	
Type 2: Willingness to take risks self-employed = not self-employed partner			
Solo self-employed*	1,136	0.524	—
Self-employed with employees*	1,136	0.476	—
Working in family business	1,136	—	0.023
White-collar employee	1,136	—	0.737
Blue-collar worker	1,136	—	0.140
Civil servant	1,136	—	0.100
Full-time employed*[a]	995	0.697	
	1,031		0.577
Part-time employed*[a]	995	0.303	
	1,031		0.423

Labor income	1,136	2,351.507	1,858.440
Household labor income	1,136	4,209.947	
Total household net income	1,053	4,448.831	
Rental income*	1,130	0.264	
Owner of the dwelling*	1,136	0.732	
Savings at the end of month*[b]	1,118	0.700	
Partners married	1,132	0.851	
Children under 16 years in household*	1,136	0.499	
Male*	1,136	0.639	0.365
Age ([22;64])	1,136	46.737	45.891
Difference in education*[c]	1,120	0.484	
Self-employed higher qualified*	1,120	0.257	
Type 3: Willingness to take risks self-employed < not self-employed partner			
Solo self-employed*	2,262	0.568	—
Self-employed with employees*	2,262	0.431	—
Working in family business	2,262	—	0.027
White-collar employee	2,262	—	0.736
Blue-collar worker	2,262	—	0.139
Civil servant	2,262	—	0.099
Full-time employed*[a]	1,943	0.594	
	2,039		0.683
Part-time employed*[a]	1,943	0.406	
	2,039		0.317
Labor income	2,262	2,008.160	2,254.482
Household labor income	2,262	4,262.642	
Total household net income	2,134	4,520.159	
Rental income*	2,255	0.235	
Owner of the dwelling*	2,262	0.669	
Savings at the end of month*[b]	2,239	0.717	
Partners married	2,255	0.884	
Children under 16 years in household*	2,258	0.549	
Male*	2,262	0.471	0.531
Age ([20;64])	2,262	45.881	45.831
Difference in education*[c]	2,238	0.427	
Self-employed higher qualified*	2,238	0.231	

Differences in number of observations due to missing values.
* Dummy variable.
a) Working time is measured by reported actual hours for reasons of consistency because the self-employed have no formal working time agreements.
b) Savings at the end of month: Money left over at the end of the month that you can put aside for larger purchases, emergencies, or to build savings.
c) Education is measured by 3 categories according to the CASMIN-classification. If one of the partners is still in school, the household is missing in this analysis.

The share of self-employed working at least 36 hours per week (full-time) is highest in type 1 households and lowest in type 3 households (see Table 4). However, concerning the entrepreneurial partners, the share of full-time paid employees is highest in type 3 and lowest in type 1 households. In line with the higher share of full-time self-employed, the self-employed in type 1 households achieve the highest labor net income. Compared with type 3 households, the difference in average values amounts to roughly 600 Euro or 23.1%.[10] Partners' income, in turn, is about 566 Euro or 33.5% higher in household type 3 compared to type 1.[11] In sum, average net labor incomes are comparable in type 1 and type 3 households. When examining the total net income, which includes all regular payments, the average incomes are larger in type 1 households. This can be due to higher assets, indicated by the largest share of households with rental incomes. Household type 2 achieves the lowest net labor income and household net income. On average, all the different types of households can be expected to be able to cover their expenses for the standards of living because seven in ten households can save money at the end of the month.

Most partners were married or officially registered as partners (Table 4). Aldrich and Cliff (2003) also discuss the role of children in entrepreneurial households. Except for type 2 households, most reported having children under 16 years old. The presence of children is related to the unequal distribution of risk preferences and renders one of the partners more risk-averse. Childcare then might be hypothesized to become a constraint in the endogenous risk function of partners within households. In type 2 households, less than half of all households have children. Furthermore, across types of households, most households consisted of partners with similar educational backgrounds. Finally, note that three in four self-employed in type 1 households are male (76.1%). Moreover, in household type 2, the majority of self-employed is male (63.9%). In type 3 households, however, less than half of all self-employed are male. In these households, females represent 53.1% of the self-employed.

In addition to discussing differences based on descriptive statistics, we also examine whether the characteristics of household type 1 differ significantly from the ones in household types 2 and 3. We, therefore, conducted a multinomial logit model (Kropko, 2008).[12] The results suggest that it seems difficult to distinguish household types 1 and 2 based on the discussed characteristics (Table 5). Compared to household type 1, households of type 2 own their dwelling

10. $\frac{2{,}612.344 - 2{,}008.160}{2{,}612.344} \times 100\% = 23.1\%$

11. $\frac{2{,}254.482 - 1{,}688.453}{1{,}688.453} \times 100\% = 33.5\%.$

12. Note that estimates are not establishing causal relationships since it is unclear what determined the distribution of risk attitudes within households. The estimates show whether the observed differences presented in Table 4 are significant under consideration of the ceteris paribus condition or when other characteristics are controlled for, respectively. Results based on the estimation of the multinomial probit model are available upon request.

significantly more commonly. Concerning the occupation of partners, the partners of self-employed in household type 2 are, ceteris paribus, more commonly white-collar workers or civil servants than in household type 1.

Table 5: Multinomial logit estimates

	(1)(2)(3) Willingness to take risks self-self-self-		
	employed > partner	employed = partner	employed < partner
Variables	(type 1)	(type 2)	(type 3)
Solo self-employed		0.1113	0.0470
		(0.0882)	(0.0715)
Self-employed with employees		reference category	
Working in family business		reference category	
Partner white-collar employee		0.4911^{+}	-0.1987
		(0.2755)	(0.1879)
Partner blue-collar worker		0.4511	-0.4707*
		(0.2940)	(0.2062)
Partner civil servant		0.6460*	-0.3177
		(0.3048)	(0.2154)
Self-employment in full-time[a]		0.0531	-0.0806
		(0.1017)	(0.0798)
Partner employed full-time[a]		0.0245	0.1360^{+}
		(0.0998)	(0.0805)
Labor net income of self-employed		0.0000	-0.0000
		(0.0000)	(0.0000)
Labor net income of partner		-0.0000	0.0001*
		(0.0000)	(0.0000)
Total household net income		-0.0000	-0.0000
		(0.0000)	(0.0000)
Rental income		-0.0049	-0.1767*
		(0.0905)	(0.0756)
Owner of the dwelling		0.3048***	0.0363
		(0.0908)	(0.0696)
Savings at the end of month[b]		-0.1204	-0.0996
		(0.0875)	(0.0707)
Children under 16 years in household		-0.0038	0.1564*
		(0.0913)	(0.0725)
Self-employed is male		-0.0174	-0.6272
		(0.4846)	(0.3815)
Partner is male		0.6801	0.4900

		(0.4793)	(0.3780)
Age of self-employed		-0.0028	0.0111
		(0.0090)	(0.0071)
Age of partner		0.0067	-0.0081
		(0.0090)	(0.0071)
Difference in education[c]		0.0445	-0.2198**
		(0.0959)	(0.0794)
Self-employed higher qualified than partners		0.0212	0.2608**
		(0.1150)	(0.0952)
Constant		-2.4110***	-0.4597
	Base outcome	(0.6427)	(0.4895)
Number of observations	3,415	891	1,790
Number of observations (total)	6,096		
Log-likelihood	-5,626.485		

Standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001
Partners are engaged in employer-employee relationships.
a) Working time is measured by reported actual hours for reasons of consistency because the self-employed have no formal working time agreements.
b) Savings at the end of month: Money left over at the end of the month that you can put aside for larger purchases, emergencies, or to build savings.
c) Education is measured by 3 categories according to the CASMIN-classification. If one of the partners is still in school, the household is missing in this analysis.

Concerning the significant differences in risk attitudes across partners, it is more interesting to compare the characteristics that distinguish household types 1 and 3. At first, partners in household type 3 are significantly more likely to be full-time employed and tend to achieve higher net incomes when compared to household type 1. However, rental incomes are less likely in type 3 households than in type 1 households. The comparably lower risk attitude in household type 3 might be because there are significantly more common children in these households when compared with type 1 households. Besides, the results suggest that partners' educational levels are more similar in type 3 than in type 1 households. However, if there are differences, the self-employed in households of type 3 seem more qualified than their partners, which suggests that individuals are unwilling to depreciate the returns to education and therefore offer it on the labor market.

Many papers have discussed that partners stand up for themselves and potentially share income-related risks. Our results suggest that the average contribution of the self-employed to total household labor income ranges between 43.4% (type 3 households) to 55.7% (type 1 households, see Table 6) and thus varies with the distribution of risk attitudes in households. However, polarization of incomes is not indicated by these averages; therefore, the results indicate that households with two employed partners diversify income-related risks. However,

in one in twenty type 3 households (5.7%), the self-employed earn at least 90% of labor income, which is the case in almost one in eleven type 1 households (9.2%), making these households vulnerable to entrepreneurial crises (cf. Schneck, 2023).

Table 6: Contribution to household income under consideration of individual risk attitudes

Characteristics	N	self-employed	partner
Type 1: Willingness to take risks self-employed > not self-employed partner			
Average contribution to total household net income[a]	4,079	0.558	0.430
Average contribution to total household labor income	4,342	0.557	0.443
Contribution to total household labor income Individual contributes at least 90%*	4,342	0.092	0.067
Individual contributes at least 75%*	4,342	0.307	0.175
Individual contributes at least 66.7%*	4,342	0.400	0.238
Type 2: Willingness to take risks self-employed = not self-employed partner			
Average contribution to total household net income[a]	1,053	0.516	0.467
Average contribution to total household labor income	1,136	0.518	0.482
Contribution to total household labor income Individual contributes at least 90%*	1,136	0.072	0.093
Individual contributes at least 75%*	1,136	0.276	0.239
Individual contributes at least 66.7%*	1,136	0.366	0.299
Type 3: Willingness to take risks self-employed < not self-employed partner			
Average contribution to total household net income[a]	2,134	0.434	0.542
Average contribution to total household labor income	2,262	0.434	0.566
Contribution to total household labor income Individual contributes at least 90%*	2,262	0.057	0.139
Individual contributes at least 75%*	2,262	0.176	0.339
Individual contributes at least 66.7%*	2,262	0.247	0.405

Differences in number of observations due to missing values.
* Dummy variable.
a) Contribution to total household net income: Individual net income exceeds in rare cases the total household net income. Therefore, the contribution of partners to total household net income might not sum up to 1.

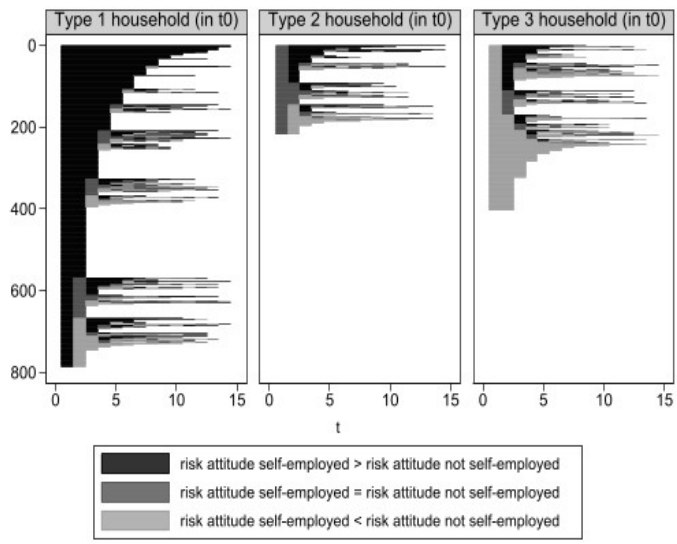
Do Partners' Risk Attitudes Change over Time?

The cross-sectional analysis is suggestive that the distribution of considered household types is rather stable over time (cf. Figure 2). However, this approach is not responsive to dynamics within households over time. In fact, with U.S. data, Cho et al. (2018) show that risk aversion is responsive to personal economic circumstances and changes over time. Moreover, Serra-Garcia (2022) suggests that the risk attitude of partners in stable relationships converges over time. We, therefore, ask whether the risk attitudes of partners within households change over time. Sequence analysis was conducted (Brzinsky-Fay et al., 2006) to

examine whether and how risk attitudes across household types changed over time.[13]

Figure 3 and Table 7 reveal considerable persistence in risk attitudes across partners in type 1 households. In most cases, the self-employed partner remains less risk-averse than the not self-employed partner over the observed time horizon. In type 3 households, the self-employed individual usually remains more risk-averse than the not self-employed partner. Identical risk attitudes in type 2 households are likely to be transitory because risk attitudes across partners frequently diverge over time, so the household either becomes a type 1 or type 3 household. In sum, we do not find that risk attitudes converged to the same values in our sample of entrepreneurial households. Transitions into household type 2, where partners share identical risk attitudes, are not systematically more common than transitions into other household types, where the risk attitudes of partners differ.

Figure 3: Sequence index plot of risk attitudes by household type



t0 refers to the first year of observation of a household.
Figure refers to households that are observable for at least 2 periods.
Household type with regard to willingness to take risks and number of observations:
Type1: Self-employed > not self-employed partner: 785

13. Sequence analysis is typically applied to describe categorical sequences in longitudinal data. In our case, the categorical information contains the household types 1 to 3 and sequences display potential changes in these types over time. The total number of 7,740 observations reported above consists of 2,505 partner combinations, which are observed for, on average, 3.090 years over the considered time horizon from 2004 to 2019. Sequences are not generated based on the year of observations, but each household is assigned a time variable t=1, 2, 3, … starting in the first year of observations. Households are assigned a new ID when partners change.

Type2: Self-employed = not self-employed partner: 217
Type3: Self-employed < not self-employed partner: 403

Table 7: Transition matrix of household types over time

Household type	Household type in year $t + 1$			Number of
in year t	type 1	type 2	type 3	observations
Type 1	75.9%	12.4%	11.6%	2,174
Type 2	42.4%	26.3%	31.3%	594
Type 3	24.7%	17.0%	58.4%	1,115

Row percentages sum up to 100%.
Years t and t+1 describe two consecutive years in which a household can be observed. No observations are available for years from 2005 to 2007.
Type 1: Willingness to take risks: Self-employed > not self-employed partner.
Type 2: Willingness to take risks: Self-employed = not self-employed partner.
Type 3: Willingness to take risks: Self-employed < not self-employed partner.

Figure 4 shows the ordering of sequences by reflecting the same order similarity and refers to households which are observable in at least two periods.[14] This analysis reveals substantial persistence in type 1 households concerning the distribution of risk attitudes. Precisely, in 410 of 785 (52.2%) of these households, the distribution of risk attitudes remains constant over time. The self-employed remain relatively more risk-tolerant than their partners throughout the observed time horizon. When the distribution of risk attitudes changes over time, the households are about equally likely to become type 2 or 3. However, many households later return to the risk distribution in the first period. Changes in the distribution of risk attitudes seem to be transitory in these households.

14. This plot is also responsive to categorical sequences but concentrates on changes in the sequences (household types). It does not reflect the categorical state (household type) in each period of observation. For example, sequence "type2 - type1 - type2 - type2" is displayed as "type2 - type1 - type2". Analogously, sequence "type2 - type1 - type1 - type1" is presented as "type2 - type1". If there is no change in type, then only one sequence is shown in Figure 4. Thus, the sequences displayed in Figure 4 are not responsive to the duration a household belongs to a particular type.

Figure 4: Sequence index plot with respect to same order similarity of risk attitudes by household type

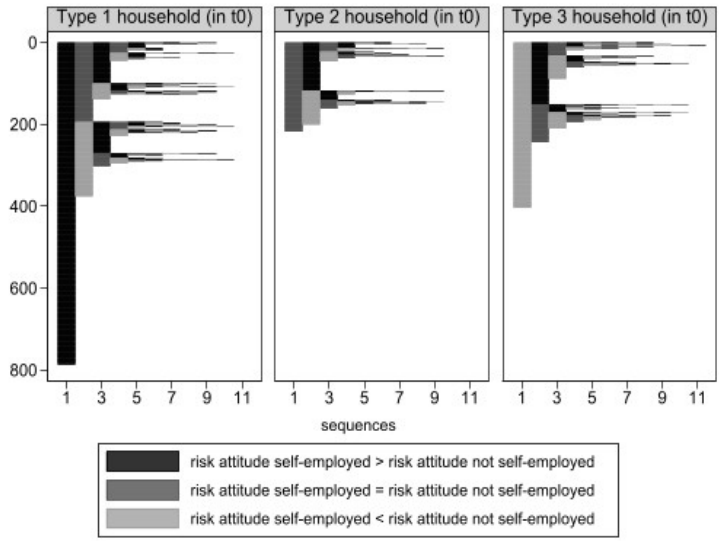


Figure refers to households that are observable for at least 2 periods.
Household type with regard to willingness to take risks and number of observations:
Type1: Self-employed > not self-employed partner: 785
Type2: Self-employed = not self-employed partner: 217
Type3: Self-employed < not self-employed partner: 403

In type 2 households, the distribution of risk attitudes changes in eleven in twelve households (91.7%). Similar risk attitudes of partners are, again, shown to be transitory. When looking at the second sequence, such households tend more likely to become households where the self-employed become more risk-tolerant than the partners, which is in line with prior studies suggesting that the self-employed are less risk-averse than paid employees. Moreover, in more than half of type 3 households, the distribution of risk attitudes changes over time across households. Closer inspection reveals that changes in risk attitudes are frequently reversing the willingness to take risks across partners.

5. Discussion

Main Results

The literature frequently describes the self-employed as less risk-averse than the paid employees in empirical (among others, Ekelund et al., 2005; Skriabikova et al., 2014) or theoretical contributions (e.g., the seminal work by Kihlstrom and Laffont, 1979). However, the comparison of randomly selected paid employees and self-employed individuals does not take social interactions into account. In

our paper, we explicitly take these interactions into account and corroborate that the self-employed are, on average, less risk-averse than the paid employees. However, this paper reveals that this stylized fact is primarily based on examining average effects and conceals substantial heterogeneity in the distribution of risk attitudes.

By examining the distribution of risk attitudes of partners within double-earner households, we present some findings that are not well documented in the literature. At first, risk-averse self-employed exist, corroborating more recent models (Hsieh et al., 2017). Second, even within households, the risk-tolerant partner is not always self-employed but decides to be in an employer-employee relationship. Specifically, we show that self-employed individuals are more risk-averse than their employed partner in 29.2% of households, while in 14.7% of entrepreneurial households, risk attitudes are identical across partners. In sum, in 43.9% of entrepreneurial households, the self-employed are no more risk-tolerant than the employed partner. These shares are surprisingly high when considering the implications of the bulk of the existing literature.

Risk and Theories of Occupational Choice

The focus of this paper is on heterogeneity regarding risk attitudes within households. Although the literature essentially describes risk attitudes as central to the choice to become self-employed, business opportunities also encourage relatively risk-averse individuals to become self-employed. The presented results indicate that households with relatively risk-averse self-employed individuals mainly consist of solo self-employed and that the partner works full-time. This result might trigger new theories regarding risk sharing, risk attitudes, and self-employment. One explanation might be that attitudes towards procedural freedom (procedural utility theory, Frey et al., 2004) dominate risk attitudes regarding the choice for self-employment. It is also possible that risk-averse individuals invest in a balanced set of skills, making them likely to become self-employed (Hsieh et al., 2017). Solo self-employment also leads to higher degrees of occupational mobility between paid employment and self-employment because of low responsibility towards own employees which might indicate that self-employment spells might be transitory because of family responsibilities or other events. Another explanation is the potential impact of life-changing events, such as getting a child, starting a life in a new town, or unexpected unemployment of one of the partners before the observation period. One might also think of temporal shocks, such as injuries or need for care (of one of the family members or relatives), mental breakdowns (burnout), etc. that might temporarily shift preferences, attitudes, and norms. In sum, the results are suggestive that it is important to consider the household perspective in entrepreneurial choice theories, which is little studied. A further important mechanism might be that incomes from self-employment are less rigid than wages in paid employment. Within short periods, the incomes of the self-employed might increase or vanish

completely (cf. Schneck, 2023), altering their willingness to take risks. Our findings call for a synthesis of the theories about occupational choice, risk attitudes, and the embeddedness of entrepreneurship in the household context. Besides, we agree with Newbert et al. (2022) and call for more analysis of heterogeneity and the study of nuances, which are commonly obfuscated by the examination of average values.

The entrepreneurial household, so far, received little attention (notable exceptions are Aldrich and Cliff, 2003; Alsos et al., 2014a, 2014b; Carter, 2011; Carter et al., 2017). In this regard, it has been discussed that the household affects strategic decision-making or business-related outcomes, but the business also affects the private sphere (Carter et al., 2017). Furthermore, work-to-family and family-to-work conflicts have been addressed (Frone, 2003). Moreover, managing economic risks at the household level has been the subject of studies (Aldrich and Cliff, 2003). Our paper adds insights into the individual attitudes of partners and adds further understanding of entrepreneurial households. All these contributions call attention to the inclusion of the family/household perspective in entrepreneurship theory. Replication studies and complementary tests of established theories under the consideration of the household provide a fruitful area for further research. In addition, testing entrepreneurship theories (and the validity of their assumptions) in the context of joint decision-making helps to gain a deeper understanding of entrepreneurship and to separate viable theories from those that do not stand up to confrontation with data.

Methodological Remarks

There is skepticism about measuring risk attitudes with survey questions because it might be questionable "whether self-reported personal attitudes and traits are behaviorally meaningful" (Dohmen et al., 2011, p. 523). The discussion about the reliability of survey questions concerning individual attitudes opens further promising avenues of research. Specifically, incentive-compatible experiments with partners and spouses might help to understand the nature of decision-making and behavior within the household context. Another open question concerns the individual perception of risk attitudes. Although we know from experimental studies that peer effects matter (Gioia, 2017; Lopera and Marchand, 2018), we know little about the anatomy of such comparisons. It is thus still largely unknown whether and how individuals compare their risk attitudes with partners, friends, working colleagues, entrepreneurs, or neighbors (cf. Clark and Senik, 2010, in the context of income comparisons). In this regard, there is a need to collect data to conclude about the most important reference groups and reference points.

With respect to methods, we wish to cite Carter et al. (2017, p. 124): "While Aldrich and Cliff's (2003) call for studies adopting a family embeddedness perspective recognized that the family construct is fraught with methodological difficulties and made an explicit recommendation to focus on households as the operational proxy for the family, most studies responding to their call ignored this

advice and continued to use either the firm or the individual as the unit of analysis." We agree that it might be challenging to examine the household perspective and therefore started with a descriptive analysis – which, however, contributed a magnitude of findings to develop and synthesize theories.

Recommendations for Future Research

We present evidence that entrepreneurial households differ when considering the distribution of risk attitudes at the dyadic level. While the self-employed are usually the breadwinners in households with relatively less risk-averse self-employed, the paid employees are likely the breadwinners in households with relatively more risk-averse self-employed. Total household-specific labor incomes, however, barely differ across household types. As a result, the contribution of the self-employed to total household income depends on the distribution of risk attitudes in entrepreneurial households. This interesting finding opens ways for theory and empirical research. In this regard, a most interesting question is how different risk attitudes within households affect the allocation of financial means toward the business. Our results reveal evidence that self-employed with higher risk tolerance than their partners seem to invest more in company growth and more frequently have employees, while solo self-employed dominate the remaining entrepreneurial households. Another distinctive finding is that the self-employed are more commonly males in household types with relatively less risk-averse self-employed and households with equal risk attitudes across partners. At the same time, female self-employment dominates in households with relatively more risk-averse self-employed. Therefore, risk attitudes and gendered norms might provide a promising avenue for future research.

Becker (1974) suggested that the allocation of resources within households is determined by the bargaining of household members. With survey data, it is unlikely to observe the processes behind entrepreneurial decisions within households. Most surveys are based on (currently) observable characteristics and rarely reflect the processes behind them. Qualitative studies provide an opportunity to learn more about the processes that lead to self-employment and the role of the distribution of risk attitudes in households. In this regard, examining how the self-employed bargain about time allocation within their households might be interesting because, in principle, they are freer to decide about working times than partners in paid employment. In addition, the allocative process within households might be considerably affected by the risk attitudes of partners or the willingness to grow a business. Another promising field of research is the analysis of the effects of the bargaining progress and different attitudes of partners on the work-to-family/family-to-work interface (Frone, 2003; Jennings and McDougald, 2007). In addition, job satisfaction and nascent entrepreneurship might also be influenced by the processes that lead to entrepreneurial decisions within households.

The result that risk attitudes change over time is documented in the literature (Cho et al., 2018) and that changing risk attitudes affect labor market outcomes (Dohmen et al., 2016). We add the finding that social interactions and the household context matter. The fact that the distribution of risk attitudes across partners within entrepreneurial households changes over time adds further complexity to empirical analyses but also provides an opportunity for further research. Risk attitude changes suggest the existence of an endogenous risk function consisting of individual traits and household-related circumstances, which is a promising avenue for further investigation. Our results show that the household is a critical determinant when it comes to the formation of or changes in individual attitudes. Therefore, future studies might identify relevant determinants of the risk function by explicitly considering the household dimension. In this regard, some potentially stimulating questions have not yet been addressed. For example, do individual risk attitudes change with the beginning of partnerships? How important is the employment status or occupational prestige of jobs of both partners? Besides, within the household context, changes in risk attitudes might have an impact on various dimensions, such as labor-related decisions (e.g., self-employment) and outcomes (e.g., firm growth), fertility, partnership stability (cf. Serra-Garcia, 2022), asset-related decisions, or the work-to-family/family-to-work interface (Frone, 2003; Jennings and McDougald, 2007). Moreover, identifying the factors that cause changes in the distribution of risk attitudes across partners is a promising avenue for future research. In sum, we encourage studies studying the role of household affairs and family issues and their relationship to risk attitudes. By inclusion of the household dimension, however, the analysis of the (causal) relationship between risk attitudes and employment choices becomes more complex and imposes strict requirements on the data.

6. Conclusion

Outcomes of self-employment are uncertain and, therefore, risky. According to the existing literature, it can be regarded as a stylized fact that the self-employed are less risk-averse than the paid employees. Existing papers usually examine randomly selected employees and self-employed individuals. This paper revisited the view that risk-taking is mainly an attribute of the self-employed by explicitly focusing on social interactions of partners, who are likely to jointly maximize utility and share values as well as norms. Our findings corroborate the central finding of prior studies. The average willingness to take risks of the self-employed exceeds that of paid employees. The analysis of average effects, however, conceals heterogeneity. Our paper shows that the self-employed are not always risk-tolerant but might be classified as risk-averse — even compared to employees. Furthermore, we show that the more risk-averse partner is self-

employed in about three in ten households, a finding that is not well documented in the literature. Therefore, we encourage further studies examining the differences between risk-averse and risk-tolerant self-employed businesses' success and strategic decisions, actions, norms, and behaviors. We also encourage economic theory to explicitly incorporate risk-related heterogeneity to make the various dimensions of entrepreneurial diversity visible and to improve policy counseling.

So far, the analysis of risk attitudes and self-employment has rarely focused on the household context, one of the most granular environments in which individuals live. In this regard, it is essential to consider that partners are highly influential when creating perceptions and entrepreneurial decisions. Specifically, partners can not only increase or decrease individual risk tolerance but also support or prevent entrepreneurial activity. Further research about the influence of partners in entrepreneurship processes and activities is encouraged. Moreover, the focus of follow-up studies must not be limited to entrepreneurial strategies or business success. Still, it can be extended, for example, to business exit (cf. Hsu et al., 2016). Besides, the presence of partners allows for risk sharing, which might yield interesting insights about entrepreneurial activities and strategies. Ultimately, this study corroborates Alsos et al.'s (2014b, p. 100) statement: "Adopting a household perspective to entrepreneurial activities introduces a novel set of issues that can be introduced into the research process."

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