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The Role of Proximity in Social Income Dynamic Comparisons and Well-Being*

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Abstract

The present study investigates the role of proximity in shaping social income static and dynamic comparisons and their impact on well-being, measured in terms of self-assessed health. Using the Spanish Survey of Household Finances (2002-2017), the study examines how individuals compare their income trajectories with those of their peers, considering varying degrees of proximity. The findings reveal that well-being is negatively impacted by static comparisons only in the case of a significant income gap with richer individuals. However, when dynamic comparisons are introduced, individuals experience an improvement in their subjective well-being when comparing to individuals who previously earned more but now earn less, as long as they drop at a certain distance. Consequently, no effect is observed when comparing with individuals in closer proximity, and effects emerge when the degree of proximity is low.

JEL classification: C29, D31, I31

Keywords: static and dynamic relative hypotheses, income, proximity, well-being.

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1 Introduction

Economic research increasingly emphasizes how social comparisons influence individual behavior and subjective well-being. Originating with the foundational insights of Duesenberry (1949) and Leibenstein (1950), research on social income comparisons has grown significantly, particularly in understanding subjective well-being through the lens of relative standing over absolute income, as exemplified by the Easterlin paradox (Easterlin, 2008). Subjective well-being—commonly assessed through measures such as self-assessed health (SAH)—reflects individuals' relative standing rather than just absolute levels of consumption or earnings (van Praag et al., 2003; OECD, 2013).

The mechanisms behind social comparisons are complex, involving both static and dynamic comparisons, as well as upward and downward evaluations relative to peers (Clark et al., 2008; Bartolini et al., 2013; Di Tella & MacCulloch, 2010). Identifying the relevant reference groups and understanding how individuals form these comparisons present significant empirical challenges (Senik, 2009; Clark & Senik, 2010). Comparisons can involve peers from various social backgrounds, like neighbors, colleagues, or friends (Ferrer-i-Carbonell, 2005; D'Ambrosio & Frick, 2012; Bárcena et al., 2017; Xu et al., 2023). Moreover, recent literature highlights heterogeneity in social comparisons' effects, demonstrating that comparison income significantly predicts depression (Benny et al., 2022; Song & Kim, 2020) and physical pain (Macchia, 2024), as well as overall life satisfaction (FitzRoy & Nolan, 2022; Yu, 2020). Income inequality at local or community levels notably affects subjective well-being, primarily through psychosocial mechanisms like envy or pride (Kang et al., 2020; Jin & Hong, 2022). Furthermore, perceived income positions within close peer groups affect adolescent mental health (Piera Pi-Sunyer et al., 2023), and income transparency policies have been found to amplify income-related well-being disparities (Perez-Truglia, 2020).

From Ferrer-i-Carbonell (2005), models of social comparison recognize that individuals react differently when comparing themselves to richer versus poorer peers (i.e., upward vs. downward comparisons). Such comparisons may occur at a single point in time (static, which is the focus of most of the literature) or over longer periods (dynamic, rarely explored, with the exception of a few studies, such as D'Ambrosio & Frick, 2012). Generally, observing others earn more tends to diminish one's well-being, while feeling

relatively richer than others tends to improve it, although some studies find the opposite (Clark & Senik, 2010).

In this context, our research makes a distinct contribution by explicitly examining how proximity, in terms of income, influences subjective well-being. By using the comprehensive Spanish Household Finances dataset (SHF, 2002-2017), we also contribute by analyzing dynamic comparisons, applying also the concept of proximity. We proxy well-being by self-assessed health (SAH).

The present analysis reveals that SAH declines only when individuals compare themselves with significantly richer others (low proximity) in the static model, whereas comparisons with more proximate income peers have no significant effect on well-being. A number of mechanisms have been proposed to explain this result: an *envy effect*, whereby observing others with higher incomes leads to a reduction in one's own well-being; and a *signalling effect*, where higher incomes among peers are taken as indicative of potential future gains for oneself. When higher incomes are sufficiently proximate, the two effects offset each other. However, if the difference in income is substantial, the *envy effect* becomes predominant, thereby diminishing personal well-being (Hirschman & Rothschild, 1973). It is noteworthy that our dynamic model demonstrates that surpassing peers who previously had higher incomes is associated with improved well-being. This phenomenon emerges only when the disparity in incomes is substantial. The underlying mechanism pertains to the aversion to inequality, which may stem from emotions such as guilt (*compassion effect*) or concerns about social stability (Bárcena et al., 2017), while feeling advantaged over less affluent peers can produce a *pride effect* (Friedman & Ostrov, 2008). Consequently, if an individual's income experiences a recent decline to a level close to that of their peers, the aforementioned effects may be mutually exclusive. However, if the decline is sufficiently pronounced, the *pride effect* begins to predominate. Both results point out the relevant moderating effect of proximity in social comparison effects.

The remainder of the paper is organized as follows. Section 2 outlines the empirical strategy used to identify the effects of static and dynamic social comparisons on self-assessed health and describes the data. Section 3 presents the empirical results, highlighting the role of proximity in shaping comparison effects. Finally, Section 4 concludes with a summary of the main findings and their implications for understanding subjective well-being.

2 Empirical Strategy

In this section, we describe the dataset used in our study and outline the methodological approach employed to assess the relationship between income comparisons, proximity, and well-being. We first present the data sources and key variables, followed by a static and a dynamic econometric framework designed to capture income disparities across different levels of proximity and to relate them to well-being.

We utilized data from the Spanish Household Finances dataset (SHF, 2002-2017) managed by the Bank of Spain. Launched in 2002, this survey provides comprehensive data on Spanish households' finances (households' income, assets, debts, and expenses). It follows a panel structure with subsequent surveys in 2005, 2008, 2011, 2014, and 2017, culminating in a sample of 46,801 observations.[1] As a proxy of well-being, we use self-assessed health (SAH).[2] The SHF uses a 5-point scale for SAH, (5, very good to 1, very poor), which we have inverted for analysis: a negative coefficient indicates poorer well-being (Table 1 for some descriptive statistics).

[Table 1 here]

Following established literature, we use net monthly household income instead of personal income, as it better reflects individual access to economic resources (Ferrer-i-Carbonell, 2005; Bartolini et al., 2013) and it captures more regular income components from all household members (D'Ambrosio & Frick, 2012). We incorporate both current equivalent income (y_{it}) and the average income ($\hat{y}_t$).[3] All income related variables in the subsequence analysis are in natural logarithms.

2.1 Static Model

Following the well-known result of asymmetric comparisons (Yitzhaki, 1979; Hey & Lambert, 1980), we model static comparison effects on well-being as follows:

[1] Although data from 2020 and 2022 are available, they will be excluded from the analysis due to the potential bias introduced by the COVID-19 pandemic.

[2] Self-reported health is commonly used to measure subjective well-being (van Praag et al., 2003). As the OECD (2013) notes, since SAH closely mirrors physical or mental objective health metrics, measurement errors are likely minimal.

[3] To account for household size and scale differences, we use the modified OECD equivalence scale.

$$SAH_{it} = \theta_0 + \theta_1 y_{it} + \theta_2 F_{B_i}(y_{it}, y_{jt}) + \theta_3 F_{W_i}(y_{it}, y_{jt}) + \theta_4 \boldsymbol{X}' + \theta_5 DT_t + \epsilon_i + \nu_{it} \qquad (1)$$

Using Yitzhaki (1979) and Hey & Lambert (1980) indices, we model asymmetric static comparison effects by relative *deprivation* (F_{B_i}) and *affluence* (F_{W_i}). We define B_i as the set of individuals with a larger amount of resources than i and W_i as the set of individuals with less resources than i. In this model, an individual's current resources (y_{it}) and their relative standing—either feeling deprived when looking up at richer peers ($F_{B_i}(y_{it}, y_{jt})$, upward comparisons) or affluent when looking down at less rich ones ($F_{W_i}(y_{it}, y_{jt})$, downward comparisons)—are central.

Our contribution stems from the introduction of *proximity* measured by the parameter h. So, instead of comparing with the entire distribution, we define comparison groups as $[y_{it} \pm h\hat{y}_t]$, where $\hat{y}_t$ represents some moment of the income distribution, for example, the mean income at time t. Then, as parameter h increases, the range of incomes to compare with increases. The usual comparison in the literature relies on groups with similar characteristics (education, occupation, age) but income, although highly correlated to them, is potentially capturing some other dimensions.[4] Thus, we consider deprivation and affluence with the following indicators:

$$F_{B_i}(y_{it}, y_{jt}) = \int_{y_{it}-h\hat{y}_{it}}^{y_{it}+h\hat{y}_t} d_t(y_{it}, y_{jt}) dF(y_{jt}) \qquad \text{with} \qquad d_t(y_{it}, y_{jt}) = \begin{cases} y_{jt} - y_{it} & \text{if} \quad y_{jt} > y_{it} \\ 0 & \text{if} \quad y_{jt} \leq y_{it} \end{cases}$$

$$F_{W_i}(y_{it}, y_{jt}) = \int_{y_{it}-h\hat{y}_t}^{y_{it}+h\hat{y}_t} a_t(y_{it}, y_{jt}) dF(y_{jt}) \qquad \text{with} \qquad a_t(y_{it}, y_{jt}) = \begin{cases} y_{it} - y_{jt} & \text{if} \quad y_{jt} < y_{it} \\ 0 & \text{if} \quad y_{jt} \geq y_{it} \end{cases}$$

Furthermore, $\boldsymbol{X}'$ describes the individual's socio-economic characteristics, such as gender, age, education, family status, and employment. For a more precise insight into long-term living conditions, we also consider net wealth, defined as assets (like financial assets, real estate, and valuables) minus debts (including housing debt and personal loans). Finally, DT_t are time-specific variables that capture consistent yearly shifts across all participants. ϵ_i denotes the unobservable characteristics that remain constant across time but differ for each individual, and ν_{it} is the usual error term,

[4] (Paul, 1991) captured a similar idea but with income ratios, but this idea was not flexible to degrees of proximity.

2.2 Dynamic Model

Building on D'Ambrosio & Frick (2012), we incorporate income dynamics comparisons, but as before we introduce the notion of proximity as in the static model. We incorporate two types of dynamic comparisons. *Internal comparisons* to one's past resources, $G(y_{it}, y_{it-1})$, usually referred to *hedonic adaptation* in the literature. This indicator is calculated as the weighted mean income of the recent four years (Di Tella & MacCulloch, 2010), emphasizing closer years based on an inter-temporal discount factor, δ.

$$G(y_{it}, y_{it-1}) = \sum_{t=T-4}^{T} \frac{\delta^{T-t}}{\sum_{m=1}^{4} \delta^m} y_{it}.$$

The second type of comparison relates to *external references*. As before, we construct deprivation and affluence indicators. Now we consider the following four groups of individuals: those consistently above (B_i^-), consistently below (W_i^-), recently moved above (B_i^+), or recently dropped below (W_i^+). Thus, we refine the previous deprivation and affluence indicators as follows:

$$d_{1t}(y_{it}, y_{jt}) = \begin{cases} y_{jt} - y_{it} & \text{if} \quad y_{jt} > y_{it}, y_{jt-1} > y_{it-1} \\ 0 & \text{if} \quad y_{jt} \leq y_{it} \end{cases}$$

$$d_{2t}(y_{it}, y_{jt}) = \begin{cases} y_{jt} - y_{it} & \text{if} \quad y_{jt} > y_{it}, y_{jt-1} < y_{it-1} \\ 0 & \text{if} \quad y_{jt} \leq y_{it} \end{cases}$$

$$a_{1t}(y_{it}, y_{jt}) = \begin{cases} y_{jt} - y_{it} & \text{if} \quad y_{jt} < y_{it}, y_{jt-1} < y_{it-1} \\ 0 & \text{if} \quad y_{jt} \leq y_{it} \end{cases}$$

$$a_{2t}(y_{it}, y_{jt}) = \begin{cases} y_{jt} - y_{it} & \text{if} \quad y_{jt} < y_{it}, y_{jt-1} > y_{it-1} \\ 0 & \text{if} \quad y_{jt} \leq y_{it} \end{cases}$$

We construct the relative deprivation and affluence indicators ($F_{B_i^-}, F_{B_i^+}, F_{W_i^+}$ and $F_{W_i^-}$), calculating the integral over the interval $[y_{it} \pm h\hat{y}_t]$, which incorporates, as before, the idea of proximity through parameter h. Thus, we extend previous equation (1) accordingly as follows:

$$SWB_{it} = \alpha_0 + \alpha_1 y_{it} + \alpha_2 G(y_{it}, y_{it-1}) + \alpha_3 F_{B_i^-}(y_{it}, y_{jt}) + \alpha_4 F_{B_i^+}(y_{it}, y_{jt}) + \alpha_5 F_{W_i^-}(y_{it}, y_{jt}) + \alpha_6 F_{W_i^+}(y_{it}, y_{jt}) + \alpha_7 \boldsymbol{X}' + \alpha_8 DT_t + \epsilon_i + \nu_{it} \quad (2)$$

In our econometric methodology, inspired by established literature (Ferrer-i-Carbonell & Frijters, 2004; Ferrer-i-Carbonell, 2005; van Praag & i Carbonell, 2008), we control for unobservable individual characteristics and potential variations in how individuals use the satisfaction scale. The SAH variable is cardinalized, and the model is subsequently estimated using the Pooled Ordinary Least Squares (POLS) method. Additionally, to leverage the panel data structure, we include time and individual random effects in our estimation ($\xi_{it} = \epsilon_i + \nu_{it}$). It is usually assumed that the error term is random and not correlated with observable variables. However, to address potential issues if this assumption does not hold, we apply the Mundlak correction, as recommended among others by Ferrer-i-Carbonell & Frijters (2004) and Ferrer-i-Carbonell (2005).

3 Results

Table 2 presents the key findings of our study. We first present (column 1) a model with no comparisons. As expected (Alvarez-Cuadrado & Long, 2011), under *no comparisons* scenario (column 1), we find that permanent income, not current, is the primary resource measure.

[Table 2 here]

The introduction of comparisons across the entire income range (column 2) reveals a negative impact of deprivation on well-being. This could be indicative of *envy effect* exerting a greater influence on well-being than the *signalling effect*, or, in accordance with the findings of Fehr & Schmidt (1999), it could be indicative of a aversion to inequality. As anticipated, and in line with extant literature, no discernible effect emerges from downward comparisons, thereby suggesting that *compassion effect* may serve as a counterbalancing force to *pride effect*. Once we introduce proximity (columns 3-7) reveals that the negative impact of deprivation only becomes statistically significant when comparing to much higher incomes ($h_y \geq 2$). As previously observed, downward comparisons, i.e.

the affluence effect, are rendered null. Generally, *envy effect* predominates in the presence of greater income disparities (low proximity), but this is mitigated by the *signalling effect* when the difference is smaller (proximity).

Using dynamic comparisons across the income distribution (columns 8-12), it was ascertained that the effects of absolute resource levels remain consistent. It is noteworthy that in this instance, upward comparisons do not exert any deprivation effect, thereby diminishing well-being. This is consistent with Alvarez-Cuadrado et al. (2016) who found that if comparisons are based on permanent income, the dynamic effect vanished. Surprisingly, the initially neutral effect of downward comparisons evolves into a positive one for those recently overtaken. This finding suggests a predominance of *pride effect* over *compassion effect* towards those who have recently been surpassed. It is important to note that these effects manifest only in the context of a broader comparison interval, characterised by low proximity. Conversely, if the incomes of the individuals surpassed during the process are sufficiently close at the end, both effects will offset each other.

4 Conclusions

In summary, the present study points out the way in which the proximity in income – termed 'proximity' – shapes the effects of social comparisons on subjective well-being. The study's findings indicate that well-being experiences a significant impact only when individuals compare themselves to those with substantially different incomes. In static settings, only upward comparisons to significantly wealthier peers have a detrimental effect on well-being, driven by feelings of envy or inequality aversion. In dynamic settings, well-being improves when individuals surpass previously better-off peers, indicating a pride effect—but again, only when the income gap is substantial.

These results underscore the asymmetric nature of social comparisons, whereby upward comparisons tend to diminish well-being, while downward comparisons are generally neutral or, in certain instances, beneficial. The interplay between emotional responses, namely envy versus signalling and pride versus compassion, is found to be strongly shaped by income proximity. Conversely, when income levels are more balanced, these emotional responses often cancel each other out, thereby diminishing the impact of social comparisons.

Overall, our study provides new insights into the long-run effects of social comparisons and their influence on subjective well-being. Future research should further explore how these comparisons evolve over different economic outcomes, such as consumption, economic cycles, and across various cultural contexts to deepen our understanding of potential broader implications.

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A Appendix: Tables

Table 1: Main descriptive statistics

SAH						
	2002	2005	2008	2011	2014	2017
Mean	3.90	3.94	3.93	3.87	3.94	3.81
Std. Dev	0.73	0.88	0.85	0.86	0.89	0.87
Min	1	1	1	1	1	1
Max	5	5	5	5	5	5
Frequencies						
Very Poor	1.08	1.00	0.75	0.76	0.95	1.12
Poor	6.72	7.23	5.95	6.27	4.98	6.57
Fair	19.8	19.9	20.4	22.4	20.0	22.82
Good	57.4	50.5	54.8	51.9	51.4	49.13
Very Good	15.0	21.4	18.1	18.7	22.7	20.37
N. Obs.	4,555	5,106	5,342	5,264	5,277	
Key variable	Mean	Std. Dev.	Min	Max		
Income	22,364	25,935	1	6,889,458		
Socio-Economic Characteristics						
Female	0.53	0.50	0	1		
Young	0.05	0.22	0	1		
Old	0.05	0.21	0	1		
Married	0.76	0.44	0	1		
Prim_Edu	0.34	0.48	0	1		
Sec_Edu	0.35	0.48	0	1		
Tert_Edu	0.28	0.45	0	1		
Fam_size	2.87	1.28	0	3		
Dep_old	0.06	0.21	0	3		
Dep_young	0.72	0.75	0	7		
Worker	0.41	0.49	0	1		
Self-emp	0.09	0.28	0	1		
Unemp	0.11	0.31	0	1		
Work Intensity	0.36	0.32	0	1		
Wealth	266,579	1,074,516	-5.90e+07	6.31e+08		

Table 2: Estimation results for income

	No Comp.	Static Comparisons						Dynamic Comparisons				
		All	$h = 0.5$	$h = 1.0$	$h = 2.0$	$h = 3.0$	$h = 4.0$	$h = 0.5$	$h = 1.0$	$h = 2.0$	$h = 3.0$	$h = 4.0$
Income (y_{it})	0.013	-0.01	0.004	-0.002	-0.011	-0.011	-0.013	0.016	0.017	0.017	0.016	0.015
	(0.012)	(0.014)	(0.013)	(0.014)	(0.015)	(0.015)	(0.015)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)
Mean Inc.($\hat{y}_t$)	0.108***	0.077***	0.089***	0.085***	0.076***	0.073***	0.072***	0.100***	0.100***	0.098***	0.097***	0.098***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Adaptation								0.544	0.58	0.593	0.574	0.552
								(0.394)	(0.379)	(0.368)	(0.354)	(0.351)
$F_{B_i}(y_{it}, y_{jt})$		-0.188***	-1.193+	-0.423	-0.355*	-0.244*	-0.238**					
		(0.041)	(0.616)	(0.272)	(0.157)	(0.106)	(0.085)					
$F_{B_i^-}(y_{it}, y_{jt})$								-0.056	-0.001	0.002	-0.002	-0.001
								(0.096)	(0.029)	(0.016)	(0.014)	(0.013)
$F_{B_i^+}(y_{it}, y_{jt})$								0.050	0.033	0.011	0.009	0.008
								(0.163)	(0.063)	(0.031)	(0.023)	(0.020)
$F_{W_i}(y_{it}, y_{jt})$		-0.017+	0.214	0.125	0.003	0.028	0.013					
		(0.009)	(0.336)	(0.136)	(0.074)	(0.044)	(0.030)					
$F_{W_i^+}(y_{it}, y_{jt})$								0.263	0.119+	0.081*	0.080**	0.069**
								(0.172)	(0.070)	(0.037)	(0.030)	(0.026)
$F_{W_i^-}(y_{it}, y_{jt})$								-0.185	-0.073	-0.04	-0.033	-0.03
								(0.192)	(0.064)	(0.031)	(0.030)	(0.028)
Wealth	1.192**	1.391**	1.153**	1.214**	1.103**	1.094**	1.060**	1.192**	1.244**	1.274**	1.248**	1.220**
	(0.393)	(0.444)	(0.395)	(0.399)	(0.377)	(0.380)	(0.380)	(0.409)	(0.422)	(0.436)	(0.435)	(0.432)
N	46801	46801	46801	46801	46801	46801	46801	46801	46801	46801	46801	46801

Note: Standard errors in parentheses. $^{+}p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. We present estimation results for five different values of $h = [0, 5, 1, 2, 3, 4$. The rest of estimated parameters for socio-economic characteristics described in Table 1 are available upon request.