

Improving Equality in Scientific Careers: The Care Factor Proposal

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Abstract. In academia, as well as in other spheres work, there exist some disparities. They are associated with discriminations based on ethnicity, gender, discipline and so on. A relevant issue concerns the hidden (male) cultural model and related tacit assumptions underlying the (academic) evaluation of the scientific productivity. In addition, concerning the latter, several research studies on care-giving highlighted the inversely proportional relation between care activities and scientific production, i.e. a slowdown on scholarly productivity. The latter could prove to be detrimental when the candidate takes part in recruiting or promotion processes, as the number of publications is often used as an important criterion in evaluation. Reconciliation policies and promoting family-friendly cultures, environments and workplaces are certainly useful tools to help dilute this effect. However, they require social and cultural changes that are (unfortunately) not immediate. Hence, practical proposals in the short and medium term to reduce inequalities in scientific careers are urgently needed. For this purpose, “affirmative actions” can help. One of these actions could be the use of the *Care Factor*, an index to weigh the scientific productivity of a candidate who is involved in child-rearing. It could be a transitional instrument, certainly not permanent, but useful to balance the gap between those who are involved in care activities and those who are not. However, the *Care Factor* should not be conceived of as a proposal to reward, but not to penalize those who care for children.

1 Introduction

In academia, as in other spheres work, there are some disparities. They are associated with discriminations based on discipline (e.g., some research topics are considered more mainstream than others are; some research methods more relevant than others etc.), on ethnicity, gender etc. On some of them, there is a significant reflection and a copious literature; on other attention, it has so far been less.

An issue not yet sufficiently explored concerns the relation between care activities and scientific production. Especially as the first could have an impact on the second. More specifically, how to grow the activity of care we can have a slowdown in scientific production. More-over, since the latter is one of the main criteria for hiring or upgrading a candidate, it becomes important to enlighten this relationship.

This correlation does not, in the first instance, pertain the theme of the genre, but who (man or woman) is engaged in care (so that both motherhood and fatherhood). Moreover, in the new generations care activities are (albeit slowly) further harmonizing,

with a greater response of men to the responsibilities and demands from the domestic sphere.

However, since they are still women to be more engaged in the care, this correlation is particularly unfavorable to them. So practical proposals in order to reduce inequalities in scientific careers are urgently needed.

2 How the Scientific Product of an Individual is (Currently)

Evaluated

Being publications (examined in their quality and quantity) an increasingly important criterion for evaluating a candidate who wishes to a job or an upgrade, it is important to carefully analyze the inner mechanisms of the evaluation process. This provides insight into how these evaluative mechanisms tend (often unconsciously) to discriminate the very people who are most involved in an activity of care, which (we assume) is the main cause of the slowdown in scientific production. Let us analyze this evaluation process.

2.1 Measurement?

Usually we hear about “measurement” of individual scientific production. However, the measurement is an operation allowed only

- a) with variables that have *continuous* properties (e.g., time, weight, height, income, age etc.) and
- b) where there is a *measurement* unit (then a predetermined amount of size, which has been conventionally accepted).

Only these two requirements, which must be present together, allow the measurement (see Marradi 1981, 1990 for a discussion).

Instead, more soberly, the evaluation of scientific production rests on other procedures or modes: counting, classification and reading (the content of a publication), which are not therefore measurements (see Table 1).

Table 1: The three procedures in the evaluation of scientific products

Counts	Classifications (not countable)	Reading (the content of the scientific product)
<ul style="list-style-type: none"> • h-index (based on the number of quotations) • number of publications (above or below the median) • Impact Factor of journals, where the article has been published • number of readers and downloads for a publication, • number of tags, bookmarks, comments, tweets or blogging to assess the impact of authors or publications 	<ul style="list-style-type: none"> • the language (preferably English) in which s/he published • if it is books or articles or chapters (of books) • whether with or without referees (in the case of publications on journals) • taxonomy of the journals (top, average, bottom journals, with preference of the top ones...) • taxonomy of publishers (with preference of prestigious ones...) • etc. 	<ul style="list-style-type: none"> • Thorough reading • Fast reading • skim

The contemporary tragedy is that the counts and classifications are rapidly replacing reading, which should be the leading procedure. In other words, how do I evaluate an article if I have not previously read? How do I assess the scientific output of an individual if I have not read his work? In theory, it could not, but the bibliometric and classificatory *nouvelle vague* has invented shortcuts: just a few to count and classification, and you are done. In this way, two (useful but surely) peripheral modes compared to the content of a publication, now become the main procedures, losing the possibility to evaluate the **merit** of a publication.¹

¹ This is precisely the criticism contained in the Declaration on Research Assessment (DORA), drawn up by a group of editors and publishers of scientific journals, gathered in San Francisco, December 16, 2012, at the annual meeting of the American Society for Cell Biology (ASCB). Since this declaration has been signed by hundreds of organizations (scientific journals and associations) and thousands of scholars. Joining DORA commits to supporting the adoption of scientifically correct

So, evaluators and recruiters are flooded with an avalanche of publications to be *evaluated in a short time* (an oxymoron!), in the midst of so many other things that a scientist has to do. The result is that the scientific products of the candidates are not read seriously (except a few cases); but only skim, searching for the sound of scholarship. A humiliating practice for the authors of the publications.

3. Monitoring or Evaluating?

This reflection, on the (current) assessment practices of the scientific production of a candidate, makes us realize that perhaps (beyond the more or less intellectually honest intent) what evaluators and recruiters are doing is not a genuine evaluation. In fact evaluation it should be “a cognitive activity aims to provide a judgement of an action (or set of coordinated actions) performed intentionally/or being undertaken, designed to produce external effects, using the tools of the social sciences, according to strict and codified procedures” (Palumbo 2001: 59). If we accept this definition, in use in the evaluators’ scientific community, counts and classifications (the first two procedures) should not fully included in the evaluation because their result is not a outcome or a (subjective) judgment, but simply an output that could provide by any person (including an administrator!) who has been provided with instructions and a related grid (a sheet showing the top, average and low quality journals; another sheet with the ranking of the publishers, and so on). Unlike the expert (the scientist in the discipline or research area) is indispensable in the third procedure, one in which it is necessary to judge, discern, identify, understand, in a word 'evaluate', having read and examined the publication.

Unlike in the first two procedures there is little evaluation and much **monitoring**. The latter, like basic research, applied research (Palumbo 2001: 64), audit (Bezzi 2001: 65, 67), benchmarking, certification, social budgeting, is **not** evaluation. Indeed Bezzi (2001: 66) puts monitoring at the opposite of the evaluation. The evaluation includes the tasks of monitoring and audit, but is not limited to them; it goes further because it adds a critical judgment. Counts and classifications can therefore be only a pre-condition of the evaluation, an initial screening; not an assessment in itself.

research practices evaluation. DORA contains 18 recommendations addressed to the different actors of the research world: funding agencies, institutions, publishers, organizations producing bibliometric data and individual researchers. One of them insists in eliminating the use of metrics related to journals - like Impact Factor- for funding, recruitment and promotions (or) as a surrogate measure of the quality, or to evaluate the contribution of the individual scientist, or decisions relating to recruitment, promotion and funding.

4. Against Abstractive Evaluation: Desperately Seeking the Society

The two procedures, become queens in the evaluation of scientific products, fall into an abstractive evaluation pattern, divorced from the social dynamics, epistemologically naive, politically inexperienced and not reflexive. This pattern, apparently rational and transparent, does not take into account of how indicators are (socially) constructed, and which representations, mental models and tacit knowledge are embedded in them.

4.1 What Makes a Person a Good Researcher: a Problem of Conceptualization

All methodological textbooks teach that to conduct research is first necessary to conceptualize the phenomenon. In other words, to define the so-called 'object of research'. I cannot start a research study on family or poverty, if I do not previously define what is a family (and we know how definitions are controversial and change over time) or who is a poor. In other words, what criteria I adopt to include that particular relationship between people in the category 'family' or what requirements must have a person to be defined as a poor.

The same applies to the evaluation of a researcher. **Before** evaluating a researcher, you must conceptualization who (or what) is a good researcher. **Before** choosing the performance indicators, we should discuss what the attributes (according to constructivism) or properties/characteristics (following realism) of the concept of 'good researcher' (the so-called 'intension') are. Instead, the common practice is moving in reverse: choosing indicators (in a confused, abstractive and naïve way, without reflecting about what is behind these cognitive tools, what is their cultural background) and then ex-post building the concept good researcher.

4.2. An Evaluation Without... Society

Existing tools for assessment of scientific production assess people as if they were impersonal data-bases, not as social actors. They assess them forgetting that they are... people (with biographies, social trajectories etc.). As if the authors and their products belong to two separate and unconnected worlds.

Instead, the assessment is primarily a social and political practice, that is guided by certain "theory-driven", cultural (tacit and/or explicit), assumptions, by particular mental models (on who is a good researcher). Not a simple observation based on neutral formats and criteria. So, as Chen and Rossi (1981, 1989), Chen (1990), Weiss (1995, 1997), Pawson and Tilley (1997) and many others have long pointed out, the assessment is only secondarily a technical issue. One example is the conclusion of research conducted by the think tank New Economics Foundation (Nef), a group of 50 economists, famous for bringing in the agenda of the G7 and G8 issues such as

international debt, whose motto is (significantly): Economics as if people and the planet mattered.

Starting from the assumption (therefore theory!) that there should be a direct correspondence between what we paid and the value that our work generates for society, Eilis Lawlor, Helen Kersley and Susan Steed (the authors of the Nef report) calculated the economic value of six different jobs, three paid very well and three very bad. As the authors explain in the introduction,

“we take a new approach to looking at the value of work. We go beyond how much different professions are paid to look at what they contribute to society. We use some of the principles and valuation techniques of Social Return on Investment analysis to quantify the social, environmental and economic value that these roles produce – or in some cases undermine” (p. 4).

Following the criterion of linking salaries to the contribution of well-being that a job brings to the community, bankers (concludes Nef) ditch the society and cause damage to the global economy. Similarly comparing a garbage collector, a tax affairs lawyer, the former contributes with his work to the health of the environment through recycling of garbage, the second harms society because he intrigues how to pay less taxes to taxpayers. So, looking at the social contribution of their job, it turns out that the work paid less are the most useful to society.

5. The Tacit Assumptions of the Academic Evaluation: The Hidden (Male) Cultural Model

Given that the evaluation is primarily a theoretical activity, it is worth to try to explore the main cultural assumptions (tacit and/or explicit), the particular mental model of who is a good researcher. In the academic common sense, an ideal good researcher is one who:

- teaches a lot (and with a good quality of teaching),
- publishes many products (better if high scholarly ones, in the form of prestigious or, at least, peer-reviewed journal articles and books in innovative areas of research)
- conducts good research,
- wins national and international grants,
- participates at national and international conferences,
- accepts institutional duty,
- participates at the department intellectual life (seminars, conferences, etc.),
- etc.

Any academic would subscribe (at least ideally) this list (Keith and Moore 1995; Pescosolido and Aminzade 1999; Golde and Walker 2006; Sweitzer 2009).

5.1. The Society Enters Evaluation: Assessment as if People Mattered

Ask ourselves now who could perform (equal intelligence) on all of these areas. Think that all can do it is utopian and takes us back to an abstractive model of evaluation. Unlike a sociologically plausible ranking would be:

1. single
2. person with partner, without children
3. person with partner, with 1 child (or a sick or disabled adult)
4. person with partner, with 2 children
5. person with partner, with 3 children
6. etc.

Leaving aside other possible combinations (like the partner away for work, the support of parents, wealthy economic conditions that allow babysitter ad lib etc.), because otherwise it becomes difficult to manage the complexity and treat it with standardized instruments.

Obviously, we are talking about people, not of men or women in particular. The variable gender (for the moment) does not come into play yet. And, when it will, it will make even more “social” the evaluation.

If this ranking is sociologically plausible (and we will soon see how it is) other questions arise:

- what is the cultural model underlying these evaluation criteria?
- what tacit assumptions are embedded in it?
- what is the underlying profile?
- maybe that Nobel Prize Rita Levi Montalcini (single) or the famous astrophysics Margherita Hack (with partner, no children)?
- is it reasonable to assume that those who have children, with the same intellectual capacity, has had a slowdown in scientific production (with a reduced capacity to do research and guarantee an institutional presence)?

5.2. Women Nobel Prize

An interesting case to document this hypothesis is the award of the Nobel Prize. How premise is interesting to note that only few women have been awarded the Nobel Prize (see Cole 1987, Wade 2002). In fact, the Nobel Prize and Prize in Economic Sciences have been awarded to women 47 times between 1901 and 2014 (only one woman, Marie Curie, has been honored twice). This means that 46 women in total have been awarded the Nobel Prize between 1901 and 2014, while men were ... 814. Women's creativity is underrepresented in science.

But even more interesting for our hypothesis is to note that many of these women did not have children (Stemwedel 2009). Comparing (by the variables birth order, marital status, children, awards — as Fulbright, Rhodes, and number of honorary awards received — highest education level and Nobel mentor) the 11 female Nobel laureates in physics, chemistry and physiology/medicine between 1901 and 2006 with 37 males who received the Nobel Prize in the same area one year prior and one year after them, it was found “that female Nobel laureates were significantly less likely to marry and have children. When female laureates had children, they had significantly fewer children than male laureates. Female laureates also had fewer publications than their male counterparts” (Charyton, Elliott, Rahman, Woodard and Dedios 2011: 203). The authors conclude that eminent women scientists tend to choose the pursuit of scientific discovery over starting families more often than eminent male scientists.

One of the reasons is long well-known: the double burden. In fact, in the 1970s started the first reflections on the “double presence” (Balbo 1978) or “double burden” “double day”, “double duty”, “second shift” (Hochschild and Machung 1990). These expressions are to indicate the dual role of women: public and private, reproductive in the family and productive in the society. The concept tricot the idea of a squeeze of woman between dual responsibilities: to the family and that to his independence, represented by the work, which results in her own penalty. This phenomenon is found in all (of course with different intensities) companies and continents. In fact, men’s contribution, in order to alleviate double burden, is understood as an option for most couples, even those who share family responsibilities equally...male role in the allocation of family work is limited to a minimum necessary assistance (Jana 2011: 176-7).

If this phenomenon is still existing in the vast majority of women working in the academy, would be reasonable to ask for a correction, a weight, an adjustment (in the current assessment procedures) that takes into account the double burden, the number of children and their care-giving?

6. Social Policies to Reduce Gender Inequalities

Since the late 1970s, worldwide, they were launched public policies in favor of gender equality. There are different (some potentially complementary; other ideologically incompatible with each other) because of the different cultural and theoretical perspectives that guide them:

- affirmative actions (Shalev 2008; Marra 2014);
- social protection (services provided by the institutions of the welfare state, monetary transfers as maternity or illness allowances, retirement etc. — see Marra 2014);

- public policies known as gender mainstreaming (Rubery 2002; Verloo 2005; Gornick and Meyers 2008; Knijn and Smit 2009);
- proposals by a more purely feminist approaches (Pillow 2002; Sielbeck-Bowen et al. 2002; Marra 2014), which consider differences between and within genders as irreducible and an asset to society, a resource to respect and promote balancing the pressures to homologation embodied in the social organization of the most advanced economies.

These four approaches are often difficult to reconcile. So much so that it has been suggested to go beyond the Feminist and Gender-based approaches (Marra 2014).

6.1 We Can Think of Something Faster?

Several studies (Barclay and Lupton 1999; Harrington, Van Deusen, Humberd 2011; Miller 2011; Jana 2011; Hook and Wolfe 2013; Kaufman and Bernhardt 2014; Rehel 2014, Pizzorno, Benozzo, Fina, Sabato and Scopesi 2014) show that the traditional type of division of roles in child rearing is changing. It is emerging a new model, in which there is greater equality in dealing with couples double careers: more and more fathers participate at the family life and are involved in caring activities (Marotte, Reynolds and Savarese 2011). In addition, social and conciliation policies (Marra 2012), which help the rebalancing of care activities between gender roles, are increasingly spreading: flexible regulation of work hours both for men and women; increase and improvement of health services; better reconciliation practices for women and men; in the State, in the businesses, in trade unions and in the civil society (see Gasauka 2011). Though the recent pandemic caused a lot of re-traditionalization regarding childcare between fathers and mothers.

However, these changes are slow and the effects of these policies manifest themselves only over decades. Waiting for these effects, could we instead introduce, immediately, some corrective to reduce (at least partially) the existing inequality, particularly by the scientific production of the mothers, which (as we have seen) is often the first criterion used to evaluate a person?

7. Towards a Care-sensitive (and Mother-sensitive) Assessment

If the care-giving involves a slowdown in scientific production, then it needs an evaluation that takes it into account, which is care-sensitive.

However, because men and women (for the moment) do not participate equally to the child-rearing and family responsibilities, it becomes necessary that the assessment should be more mother-sensitive. If men and women are different (and often unequal)

in society, we cannot assume that the effects of this diversity (and inequality) are suspended when we turn to scientific production. The same applies to the mothers. However currently there is little attention toward a differentiated assessment of the scientific production, so pretending that in this respect men and women are equal.

7.1. Unfortunately, For Mothers ... Few Data

Researchers who compared the scientific production between men and women (to see if there is a real difference) rarely report the data about the fact that these women have or not children. There are few academic data which include this information and have the related variable that would be very useful for a more accurate assessment.

In fact, on the side of the scientific production, it does not seem reasonable to hypothesize differences between men and women if both childless. Instead, the discussion would become more interesting if we could “discover” if children (in addition to diseases, care of parents, lack of livelihood etc. which here we do not consider) are a possible and important cause of the slowdown in production scientific (and the difficulty of doing research, participate in the institutional life of the department, conferences etc. which, again, here we do not consider). Just now that many investigations in different Countries show that child-rearing is still strongly attributed to the mothers.

Unfortunately, current research and comparisons rarely outsource this data and therefore do not help us to understand whether there is an impact of children on women's scientific production. For example, Tower, Plummer and Ridgewell (2007) conducted a study on top (according to them) six journals in the world, as rated 2006 Thompson 'ISI index. They chose two for each category: 2 in science (Science and Cancer Journal for Clinicians), 2 in business (Academy of Management Review and Quarterly Journal of Economics) and 2 social sciences (Archive of General Psychiatry and Harvard Law Review). Leaving aside the questionability of this selection (for example I am not sure how many social scientists know the existence of the last two journals...), they find no difference (in 2005) in productivity when the percentage of the women participating in the academic work force is factored in: 30–35% of participation rates in academy university position and represented almost 30% of the authors in the top tiered journals. In addition, they did not find any significantly statistical difference in journal Impact Factor ratings between women and men. This is an example of abstractive statistical analyses, totally decontextualized. Except that their analysis covers six top journals only (so the generalizability of these results should be at least cautious), the authors do not check if those women have (or not) children. They take into consideration only the (abstract) variable ‘gender’ without any contextual analysis to understand the biography of these women and men (age, marital status, children,

etc.). The same 'bugs' is in Rothausen-Vange, Marler and Wright (2005) and Dasaratha, Raghunandam, Logan and Barkman (1997).

So there remains only look comparative research between men and women, and then weigh these results via a virtual or "thought experiment" (*Gedankenexperiment*), with the use of 'counterfactual' conditionals (Van Dijk 1977: 79-81), a type of research used in economics, physics, cognitive sciences, history, etc. (see Gobo 2008: 151-152).

7.2. Women's Scholarly Productivity

Much of the literature on work/family issues in academia suggest that women with children have a harder time maintaining an ideal career because of the difficulty of combining work and family activities, both of which are regarded as "greedy institutions" (Hochschild 1975). Women "are expected to (and often do) take on more childrearing and housework responsibilities. If separated or divorced, women are more likely to be the custodial parent. There is considerable literature that women academics are hampered in their efforts to have an ideal career" (Spalter-Roth and Van Vooren 2012). According to a report from the Committee on the Status of Women in Sociology (2004): "Women may face serious disadvantages. Careers often are built ...around a model of a worker who has no competing responsibilities to work and is able to devote full attention to (usually his) professional life. Persons who do not conform to this pattern of the unencumbered worker will be disadvantaged in achieving success within the profession".

In a study of doctoral students at the University of California, over 70 percent reported that they considered academic careers in universities unfriendly to family life (Mason 2012). Women with children "may be unable to regularly stay late to muse over intellectual questions with colleagues at the office or a local pub, but instead may have to pick up children from school or day care or return home to prepare dinner" (Spalter-Roth and Van Vooren 2012). In addition, women may sometimes need to bring the baby to class with them (Kennelly and Spalter-Roth 2006).

Research suggests that parenting within the academy is a gendered phenomenon. Mason and Goulden's (2002) widely-cited study of a nationally representative sample of PhD recipients between 1973 and 1999 finds that raising children, especially early in one's academic career, has a negative effect on women's but not men's careers: women who have children are more likely than men with children to have marginal or alternative careers.

However the research on women's the scientific productivity offers other controversial results, and not always easy to interpret. If on one hand women begin to be more productive when the children are older, more independent and less in need of care Kyvik (1990), on the other hand the same Kyvik, and amazingly the same

article, states that both men and women, married and divorced people are more productive than singles.

A datum not credible, in the light of the above statements. As it is the next result: women with children are more productive than women without children (Kyvik 1990). These are statistics out of context, without an account of social dynamics. In other words, it would be important to know: who are those women with children? How many do they have? 1, 2 or 3? Have they domestic help? To which social class they belong? Without this information, any interpretation appears shaky.

Instead, to Long, Allison and McGinnis (1993) result that although men and women start out as assistant professors with similar productivity, after 6 years men have significantly more publications. Kyvik and Teigen (1996) notice that in the span 1989-1991 (of their database), men had on average 6.9 articles, while women 5.6 (20% less); in the same period (1989-1991), male faculty member under age 40 published twice as many article equivalents than their female counterparts, whereas for faculty over age 40 the difference is small (10-15%) (Kyvik and Teigen 1996).

From this research, although not always consistently, it begins to emerge with some clarity the differences between men and women.

Ward and Wolf-Wendel (2012) did a longitudinal study, interviewing over one hundred women who are both professors and mothers, and examining how they navigated their professional lives at different career stages: how women faculty on the tenure track managed work and family in their early careers (pre-tenure), when their children were young (under the age of five), and then again in mid-career (post-tenure) when their children were older. The findings suggest that family plays a role in how people develop in their academic careers, just as careers play a role in how people evolve in their family.

7.3. Women and Bibliometric: What Happened in Italy?

In 2012, in Italy, the National Agency for the Evaluation of the University System and Research (ANVUR) settled (by ministerial decree) the minimum requirements to become a full professor. Shortly after Corsi and Zacchia (2013) did a simulation by applying the ANVUR's bibliometric "recipe" to the scientific production of the women economists, to see how many of them (already faculty and potential candidates for promotion to full professor) satisfy the criteria established by the ANVUR. The result was surprising.

If we look at the median of journal articles and book chapters, out of a total of 301 female economists (including 110 associate professors) only 22% of lectures and associate professors satisfy the first requirement, which had a median equal to or greater than 8. Unlike for men the percentage of success is 35%. If we look at the median of the books, only 3.6% of female lectures and associate professors had

published at least one monograph over the past decade. In addition, in this case the percentage male was higher and equal to 9%.

Finally, if we monitor the median of publications on top journals, the criterion of excellence of the economic disciplines SECS-P01/P06 ranges from 0 (in science of finance, economic history, history of economic thought) to 6 publications (Econometrics) in ten years. Although this was a poor coverage of the top journals in the Econlit data base, only 26% of female economists had at least one publication in the past decade included in the list of the requirements of “excellence”: specifically, 25% of associate professors and 27 % of lecturers. In this case, the gender gap was more pronounced; because about 90% of men had at least one record in the last ten years published a top journal.

7.4. Causes of Gender Disparities in Academic Publishing

In literature, the underproduction of academic women in research outcomes have been pointed out in:

- Women and men tend to collaborate with co-authors of the same sex; because there a relatively few women in faculties, women have more difficult to find co-authors (Ashcroft, Bigger and Coates 1996; Suitor, Mecom and Feld 2001; Bentley 2003).
- Females are more likely to work in non-tenure track, part-time and temporary positions, to work in teaching colleges... less time for research and publishing (Dasaratha, Raghunandam, Logan and Barkman 1997; Mathews and Andersen 2001; Robinson 2006), more involved in service activities at the expense of research (Dasaratha, Raghunandam, Logan and Barkman 1997; Maske, Durden and Gaynor 2003; Corley and Gaughan 2005; Robinson 2006) disadvantaged by family responsibilities (men spent more time in university and less at home, even among married faculty), especially during child-rearing years (Mathews and Andersen 2001; Bentley 2003; Suitor, Mecom and Feld 2001).

These causes are slowly removing. However, they take a long time, and social and cultural changes are not easily predictable. Therefore, it would be necessary to do something now.

8. Contextualizing Indicators (and Consequently Factors and Indices)

To accelerate the achievement of equality in scientific careers, it is necessary to adopt different criteria for the evaluation of CVs, and in particular for the scientific production. If, as the literature has documented, men and women are different (and diversity management is now a reality), it is not clear why they should be treated as equal.

To this end, the proposals can be many and diversified. If a candidate is strongly committed to child-rearing, it could (for example) normalize her/his scientific production by the number of children². That the weighting can be reasonable is testified by the practice (now widely accepted and published) of normalizing the scientific production for the age of the candidate. So, we can assume different remedies (even standardized as weights, corrective coefficients, adjustments, normalization etc.), that take account of social dynamics and inequalities in behalf of those engaged in activities of care, in order to better assess the scientific production. For example:

1. To normalize, to attribute a score, an additive weighting etc. to those who have children or
2. To give priority to the quality of publications, rather than quantity: candidates could indicate three publications (which they consider the best, the most innovative, etc.) and the assessment will be on those only. So at least the referees will read them ... what they do not do when they receive 20 publications
3. To give space in the cv for quality management (practical skills, multi-tasking, negotiation skills, ability to reconcile different commitments etc.) that come from playing a role of mother/father strongly present in the family (see 11)
4. To make a multidimensional assessment of research (see Ferrini and Tucci 2011).

8.1. The Multidimensional Assessment of Research: the R Factor

The economists Ferrini and Tucci 2011, in proposing a multidimensional evaluation of research, start from two very "social": assumptions (2011: 27-28):

² Obviously taking into consideration that the number of children owns cardinal properties apparently only: in fact three children are not 3 times 1 son. Again social dynamics should be taken into account, because the burden of caring three children depends on many factors: whether there are some twins, or they have few or many years apart from each other, etc. That is why when the society will enter also in mathematics will be (welcome, but) always too late.

1. The publication of articles is only one aspect, albeit important, of a researcher's scientific activity;
2. There are a number of activities, not always visible (and not always transformed into articles and citations), which nonetheless contribute to scientific progress.

To take better account of these two assumptions, they have construct what they called index R-factor.

It consists, in turn, by the following sub-indices:

- Articles published in journals index
- Monographs and essays index
- Grey literature index
- Coordination activities (conferences, research groups, coordination, doctoral classes, theses supervision) index
- Dissemination activities (seminars, conferences etc.) index
- Type activities publishing (journal editor, board member etc.) index
- Administrative activities (dean, chair, coordinator, director of research centres) index.

But we could put (albeit not required by the authors) also:

- The amount of teaching hours
- Annual number of exams
- Number of theses and dissertation tutored
- etc.

As we can see, the term "evaluation" (attributed to this proposal) is very stretched, being nothing less (and no more) of a complex monitoring. However, the proposal looks very interesting and fruitful. In it would look a Care-factor index, built on:

- Number of children
- Children age
- Health status of children.

While taking into consideration other indices (such as parental capital, economic capital, etc.), even if significant, it could be complicated.

9. The C Weighting and its "Enemies": Men and Women

Although there is a broad consensus on the need to balance the parental roles, then when we move to operationalize this need (through technical proposals) various opposite claims arise.

The main "enemies" of the C weighting are primarily men (especially in the Latin Countries, basically more reluctant to split care practices with their partner) because it is reductively seen as an advantage (exclusive) for women. In fact, it is difficult to make

understandable to men that it could be applied also to a father who decides to spend more time with children and family. It is no coincidence that, although in many Countries there are rules allowing fathers to take advantage of parental leaves (for child-rearing), requests for such leaves are scarce: many men are ashamed to express this desire and prefer to give the benefit up rather than be exposed to jokes and macho criticisms by males (and also by some female colleague).

A second aspect concerns the competition between universities: if the goal of an university is to maximize its results, it will tend to recruit candidates who publish more, do more research, more education, are more institutionally present etc.; why should hire or promote career advancement for those who (like women), probably, is less productive? However this type of reasoning (tacitly quite spread) is based on a very limited rationality, unable to think globally, because ultimately the universities stand on (both economically and educationally) on students. Moreover, today children could be the students of tomorrow. If for someone the reproduction of the species cannot be a positive value for the community (therefore as such not be positively evaluated) the fact remains that someone has to take responsibility for this task. Of course, we can decide to discourage reproductive activity to scientists and delegate it to unemployed, poor, migrant people etc. But at least that this (aberrant) plan needs to be made explicit and not only tacitly active in recruiting practices.

It may seem paradoxical, but also quite a few women waves in front of the C factor (as they still are, or have been for years, for the affirmative actions). One such feature is the “wonder women” (by the 1941 famous comic): mothers who spent their lives doing somersaults in balancing work and family and that, in the face of enormous personal sacrifices, “they make it”, that is became professors. They do not believe in the correlation that to more children follows less scientific productivity. Indeed they think that if they made it, then other women can do, thus entering into a macho loop that damages the younger generations of women (who, not random, have raised the age of motherhood or chose not to procreate). Therefore, they believe that mothers do not need affirmative actions to “tear up” the men’s competition.

10. Conclusion

Several researchers on care-giving highlight how it has an impact on the scientific productivity of a scientist, causing a related slowdown. The latter could prove to be diriment when the candidate takes part in the selection (often based on the criterion of their publications) for recruiting or promotion.

Reconciliation policies are certainly a useful tool to dilute this effect. Also promoting family-friendly cultures, environments and workplaces are important, and institutions of higher education are increasingly recognizing that being “family friendly” is an asset

in terms of recruiting and retaining top faculty members (Evans and Grant 2008; Ward and Wolf-Wendel 2012; Mason, Wolfinger and Goulden 2013). However, they require social and cultural changes that are (unfortunately) not immediate. So practical proposals, short and medium term, in order to reduce inequalities in scientific careers are urgently needed. Affirmative actions such as those active, for ex-ample, in the company law where the boards of directors of listed companies and publicly owned corporations are required to have at least 1/3 of women. They are affirmative actions of short or medium term (e.g., valid for 10 years) within which it is hoped to achieve the goal of removing the obstacles that have so far limited the access of women to leadership roles, encouraging a process of cultural renewal in support for greater meritocracy and growth opportunities. Through these actions thousands of women had (and still have) the opportunity to take on leadership roles (although it would not hurt also extend this rule to academic staffs such as the Senate and the boards of directors of the university).

One of these affirmative actions, in the academy, could be the use of the Care factor, a tool to weigh the scientific productivity of a candidate who bears the child-rearing. A transitional instrument, certainly not permanent, but useful to balance the gap between those who are involved in activities of care and who is not.

However, the Care factor should not be conceived as a proposal that rewards those who care for children; unlike, it is not meant to reward, but not to penalize those engaged in care. Not only. The care activity should be enhanced even further and become one of the different recruitment and promotion criteria. In fact, the child-rearing is not to be conceived exclusively as a burden, a subtractive activity not related at all within academic activities. Unfortunately, as Ward and Wolf-Wendel (2012) write, much of the existing literature on balancing work and family presents a pessimistic view and offers cautionary tales of what to avoid and how to avoid it. In contrast, child-rearing is bearing skills that the academy, like every other working sphere, badly needs. As Balbo (1978) theorized, the “double presence” is a way to “pass through many worlds” and thus be more innovative in both areas (work and family). Competences and practical skills learned from juggling in many areas, from negotiating and reconciling different needs to mediating between different instances come in handy especially in collective dimensions of the research work, as well as in the management of the university.

That the idea of a Care factor is not so implausible is witnessed by Acumen, an EU Seventh Framework Program funded European project, which aimed to find assessment parameters, not so much of the research as the work of researchers. For example, in its *Guidelines for Good Evaluation Practices* (April 2014), the calculation of the academic age is based on a conventional value which takes account of the

number of children raised (p. 10), of special allowances and other 'penalizing' factors (like diseases, part-time jobs etc.).

The dream is that become popular experiences such as that experienced by Carol V. Robinson: she went to work at age 16, then graduated and take a bachelor's, a master's degree and a Ph.D. in chemistry. Then she left the university for eight years to raise three children. On her return, by her research she gained a professorship at Oxford (the first of a woman in chemistry) and countless awards, including the *Dame Commander of the Order of the British Empire*.

She succeeded without the Care factor. However, it is also an isolated case. Can we do something to make it more widespread? The *Care* factor goes in this direction.

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