

“Nobody Told Me I was a Nano-Consumer:” How Nanotechnologies Might Challenge the Notion of Consumer Rights

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Received: 15 February 2009 / Accepted: 23 October 2009 /
Published online: 5 November 2009
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Abstract Regarding nanotechnologies and the consumer, a central paradox is the absence of a regulatory framework while more than 1,000 nano-enabled products are already available on the consumer markets. This represents a serious challenge for the consumer interest. Even though the prospects of nanotechnologies are truly fascinating and represent possibilities to solve major problems—for instance in the realms of health, energy and poverty—it is important to also discuss the potential risks of nano-enabled products. The present study reports on a Norwegian study with data derived from focus groups, a content analysis of advertisements, packaging and labels for cosmetics as well as on a Norwegian consumer survey. Conceptually, the paper is based on the notion of consumer rights introduced by President J.F. Kennedy in 1962. Based on the results of these studies, consumer policy implications are sketched.

Keywords Consumer rights · Nanotechnologies · Nano-enabled products · Consumer information

Nanotechnology—or often today: “nanotechnologies”—has been praised as a new industrial revolution (Marburger 2002). The shift from the singular to the plural form on paper emphasises that there are several different technologies in reality. This again results in a broad range of possible applications that may transform products in a number of industries. Further, nanotechnologies are referred to as enabling technologies, pointing to the ability they may have in dramatically improving well-known technologies to solve many of the pressing environmental and health challenges that face us.

The more than 1,000 nano-enabled products currently available on the consumer market (PEN 2009) appear to be somewhat in contrast to the high hopes and far-reaching visions that tend to surround nanotechnologies. These products strike one as slight modifications of

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existing products, rather than revolutionary ones (Throne-Holst and Stø 2008). This might be explicable by the fact that nanotechnologies have just begun to be applied to products and that we are early in the trajectory. “Revolutionary” products should only be expected in 5 to 10 years. Still, current applications do not give the impression of being answers to any overriding important challenges: Lighter tennis rackets, odour-free socks, or more effective anti-wrinkle creams do not contribute to the most pressing challenges that face humanity and do not alleviate human living conditions in the poorer parts of the world. Provision of clean water (“Cleaning up” 2008) and cheap energy (DoE 2004) are two examples of such possibilities.

The studies presented here focus on consumer products currently available on the market, herewith avoiding a discussion on potential future benefits and keeping the research close to reality (Rip and Nordmann 2009). Consumer reactions and reflections on nano-enabled marketed products should be of interest beyond academia: If one or more of these products fail spectacularly or induce serious health and/or environmental damage, this might severely impact on consumers’ trust and support—and hence on the further development of these promising technologies. Financial and political support may dry up if consumers grow wary of products produced with nanotechnologies. As the focus of our study is on marketable products, we considered it relevant to examine the consumer rights in this context: What about the status of consumer rights on such emerging markets where investments are high and the hopes for the future are soaring?

Consumer Rights and Nano-Enabled Products

The conceptual starting point of our analysis is the famous set of consumer rights. In a special message to the American Congress, the Kennedy administration formulated the following four fundamental rights (Kennedy 1962): the right to safety; the right to be informed; the right to choose and the right to be heard. While an analysis of the legal status of these so-called rights should be left to scholars in consumer law, the basic idea of the concept is that these are principles that consumers might refer to rights and that consumers can claim if they are violated. These four rights have later been elaborated and expanded, for instance by the International Organisation of Consumer Unions (today known as “Consumer International”) for the United Nations (UN 2003) as well as by a number of national administrations. The notion of consumer rights has also triggered academic interest: The American Council on Consumer Interest invited international scholars to a conference and later on published a book on the subject in the 1980s (Maynes 1988). This interest has also been visible in the *Journal of Consumer Policy* where the consumer rights debate always had its home (e.g. Harland 1988).

In this note, we focus on the four original rights since they represent the “core” of the concept while the more recent ones are derived from these four rights. Even though the rights are not often explicitly stated—as for instance, in the Charter of Fundamental Rights of the European Union and European Union Law (European Parliament 2006)—they do form the backdrop for most of EU consumer protection policy. Our starting hypothesis is that these four consumer rights, although revolutionary and necessary at the time they were introduced, can be considered almost self-evident and non-disputed in today’s Western world. As such we do not expect them to be seriously jeopardised on most consumer markets, even when products resulting from a new set of technologies are introduced. As most consumers do, we assume that the four rights are widely and generally respected. Yet, the consumer rights come with a number of underlying assumptions and ideas; they were

formulated in a specific society in a specific historical and economic situation (i.e., an affluent, industrialised market economy, a consumer society). Since they are still in use and considered relevant, we conclude that either the societal conditions have not changed very much or that they were formulated in a sufficiently general way so as not to become easily outdated.

Based on an empirical study of Norwegian consumers, the objective of this essay is to assess each of these rights as regards markets of nano-enabled products. We are interested in questions such as: What is the status of the respective consumer right among groups of ordinary citizen-consumers? How are issues that are connected to these rights articulated in public discourse? How are they understood, and how are they brought into the nano discourse? In other words, we aim to evaluate consumers' reflexivity (Beck 1992; Giddens 1991, 1994) as regards nanotechnologies.

First, the *right to safety* was specified¹ as the right to be protected against products, production methods and services which are hazardous to health or life. While this right is widely taken for granted today, this was not the case back in 1962. The idea that businesses might offer unsafe products was considered radical; indeed, most safety regulation was still to come (Swagler 1997). For the field of nano-products, the safety issue will mainly be a question of risk assessment: Given the limited utility of the current products, what levels of risk are we willing to accept under conditions of uncertainty and who should decide on the acceptability of a level? Second, the *right to be informed* was specified as the right to be given the facts needed to make an informed choice as well as to be protected against dishonest or misleading marketing techniques. The relevance for nano-products here is rather obvious: Only if product qualities and markets are made transparent, can consumers make informed choices. In the focus groups of Norwegian consumers, however, participants had no idea that they were already consuming nano-products and, therefore, were never in a position to make a choice for or against them. Hence, the *right to choose* is not secured at all. Only if consumers are informed, they can exert their right to actively decide. Fourth, the *right to be heard* is specified as the right to have consumer interest represented in the making and execution of government policy as well as in the development of products and services. The focus here is not on individual consumer complaints but on the organised consumer interests' right to influence policy as political actor in a governance model. Organisation of consumer power is clearly relevant in consumer policy on nanotechnologies.

The Study

Methods and Data

The present note is based on the analysis of the following data: a content analysis of advertisements, packaging and labels in Norway for cosmetics; a focus group study on nanotechnologies and products in Oslo and a representative Norwegian consumer survey. The first two were collected in connection with a project financed by the NANOMAT programme by the Research Council of Norway, a collaboration between the National Institute for Consumer Research (SIFO) and the Manchester Institute of Innovation Research (MIORI) at Manchester Business School. The project set out to compare ethical aspects in the

¹ The specifications are part of the original Consumer Message by President Kennedy, see Kennedy (1962).

marketing of nano-products in Norway and the UK (Throne-Holst et al. 2009). The survey was carried out by the SIFO.

Content analysis Advertisements subjected to content analysis were mainly collected from Internet websites, coming from various sources such as producers, importers, magazines and retail. They were saved as screen-dumps or print-outs. According to an inventory of manufacturer-identified nanotechnology-based consumer products currently on the market, the two biggest product groups to date are cosmetics and textiles (PEN 2009). This is what we focused on in our study. Which Internet pages we visited, and subsequently which actors we selected for follow-up interviews, was derived from the analysis of commercials in both magazines and newspapers and on results from web search such as the above mentioned online consumer product inventory. In general, the focus was on actors who used “nano” more or less openly in their customer communication. L’Oréal, the world’s leading cosmetics group with 23 international brands in its portfolio (L’Oréal 2008), increasingly came into the focus of our study: When we started the web search, the company sold and advertised the “Revitalift” series emphasising that the products contain a nano ingredient (“nanosomes”). One of its brands is Lancôme. It turned out that the information available on the different geographically tuned web pages of Lancôme varied, which made these web pages an interesting study in cultural differences in themselves (Throne-Holst et al. 2009). Other websites of other major brands were also searched.

Focus group study The focus group study took place in Oslo in June 2008. Four focus groups of “ordinary” consumers were selected. The recruitment base was men and women between 25 and 65 years of age. Since we assumed that in mixed gender groups, men would dominate the discussion on such a technologically oriented subject, groups were divided by gender. We also suspected that age would matter when it comes to the familiarity of new technologies. Hence, we split respondents into age groups. We recruited from ordinary consumers but explicitly targeted those with a minimum of 3 years of higher education, given the complexity of the issue. To avoid “expert talks,” we excluded consumers with educational background in physics, chemistry or biology—which fields are highly relevant for nanotechnologies. Participants were not informed about the subject of the focus group beforehand. The size of the groups was small (five to seven participants, a “mini-group”) in order to increase the possibility for identifying and expanding on individual attitudes and to allow for reflection and elaboration of positions. The sessions lasted between 1.5 and 2 h and took place in the offices of the market research agency in Oslo. The group discussions were moderated by a professional moderator and the participants were paid 600 NOK as compensation for their participation. One of the researchers (and authors) was present, giving a 30-min introductory presentation on nanotechnologies. Considerable effort was put into making this presentation balanced, i.e. presenting both the pros and cons of nanotechnologies. Before the presentation, the participants discussed modern technology in general. Some clarifying questions were allowed after the presentation. Then, participants were asked to reflect on what they had heard, especially on the role and responsibility of the different actors in the value chain. A range of nano-enabled products were displayed on a table for the participants to look at, touch, and reflect on, namely: car polish, sun cream, ski wax, cigarettes, anti-wrinkle cream, textiles, plaster/band-aid and Apple’s iPod nano.

Consumer survey The Norwegian SIFO survey is a country representative annual survey aiming at understanding consumer issues seen from the consumer’s perspective—as opposed to the supply side’s interests. In the survey of 2008, some questions on

nanotechnology were included.² The data were collected in October 2008 by computer-assisted telephone interviews from a sample of 1,000 randomly selected Norwegian respondents aged 18 to 80 years.

Selected Results

The right to safety While nanotechnology-based products are constantly entering the market, the current regulatory framework for these kinds of products remains unclear and unsatisfactory. On the method side, adequate test strategies and assessment procedures are still missing (Orthen 2007). Recently, questions have been raised as regards the appropriateness of the weight/volume thresholds in the new European Community Regulation on chemicals and their safe use (REACH³) for handling nanoparticles: For such substances, the production volume might be lower than the ones prescribed by these regulations (ANEC/BEUC 2009; RCEP 2008, p. 65). Testing protocols will also have to be developed for the new substances; however, under current regulations, it can take up to 15 years for a protocol to achieve regulatory approval (RCEP 2008, p. 6).

In the focus groups, the immediate reactions of the participants to the introductory presentation were quite ambivalent; however, in all groups, respondents expressed concern if not fear. In general, men were less worried than women:

“How can it be possible that these things are being produced when their potential harmful effects are unknown?” (Hanne, female, 45+)

“The possibility of assessing potential danger in advance is probably higher today than it used to be.” (Arnstein, male, 45+)

“I was a bit scared by the downsides. You very rarely get to hear about them.” (Oddvar, male, 25-45)

To date, it is not considered possible to satisfactorily judge the risk of nanomaterials before they are put into use (SFT 2008). This seems to come as a surprise to the participants who generally believe that “somebody” controls products before they appear on shelves.

“We trust the authorities; if it is on sale in a pharmacy, we regard it as safe.” (Tom, male, 25-45)

“If it is dangerous or harmful, the politicians and their control agencies have to make sure that it does not enter the market.” (Tom, male, 25-45)

In most countries, the ultimate responsibility for consumer safety is considered to lie with the government. In the case of nanotechnologies, regulation has to deal with questions of whether, how and even *what* to regulate. For instance, silver on nano scale has completely different characteristics from silver in bulk form. This case is a rather pertinent one: As silver is an element that most people have a positive physical experience with in the

² The following questions concerned nanotechnologies (translated): How much have you heard about nanotechnology? If so, where have you heard about nanotechnology? Do you think that products produced with nanotechnology should be labelled? How big advantages do you think nanotechnology can result in? How risky do you think nanotechnology is? Do you know of any products in shops that contain nanotechnology? If so, which ones?

³ REACH: Registration, Evaluation, Authorisation and Restriction of Chemical substances. The new law entered into force on 1 June 2007 (European Commission 2007).

form of cutlery or jewellery, most consumers would deem it safe and rather inert. Yet, enter the nano scale form of it and you have a rather potent biocide. This is a difficult message to get across. As of now, regulatory authorities admit that the current legal framework is insufficient. This is partly due to the fact that methods of how to measure and how to assess the risks of nanotechnologies are still under development. We were interested in how consumers regard and relate to potential risks with nano-enabled products. In the focus groups, participants very often seemed to accept a certain level of risk and were reluctant to stop technological development:

“It is very hard to stop a technology with such a vast potential” (Steinar, male, 25–45).

“Everybody knows that good new products come with a downside as well” (“Tom, male 25–45).

“It’s impossible to stop the development” (David, male, 45+).

We suspect that participants often take for granted that the added benefits of nano-enabled products are substantial. Such evaluations seem to be in line with the firm belief in technologies’ general ability to solve challenges without creating new ones, as found in an earlier study of Norwegian stakeholders (Throne-Holst and Stø 2008).

The right to be informed Between 2002 and 2006, the Research Council of Norway spent more than 330 million NOK (about 41 Mio. Euro) on nanotechnology development. Nanotechnology is designated as one out of three committed research fields by the Norwegian Parliament, together with ICT and biotechnology (Norwegian Parliament 2005). However, four out of ten consumers in Norway had heard “nothing” about nanotechnology in our consumer survey. This rather low level of public awareness is actually in line with what has been found in other studies in the USA and across Europe (Hart 2008; Satterfield et al. 2009). The question is: Who should be the one to inform and educate consumers? When we asked our survey participants, the majority pointed first to the authorities (as usual in Norway) and then to producers.

We believe that a societal debate on nano issues and a high degree of transparency of markets is a precondition for making the information relevant. It would also contribute to political awareness, as well as the possibilities and the risks surrounding the nanotechnologies. As of today, “nano” is not a protected or mandatory label. This can hit both ways, as we see in the examples in Table 1. Here, “nano” is used in contexts where it does not seem very appropriate. These products are not “nano” but are labelled or named as such. Can this contribute to making “nano” a concept devoid of meaning (for consumers)?

Table 1 Using the “nano” label when it is not

Product	Rational for using “nano”
TATA “nano”—the people’s car	“The name ‘Nano’ was chosen as it denotes high technology and small size.” (Tata Motors 2008)
Nano Sail-D (NASA)	The term “nanosatellite” or “nanosat” is usually applied to the name of an artificial satellite with a wet mass between 1 and 10 kg. “NanoSail-D is a very small satellite, just a bit longer than a loaf of bread and weighs in at around 9 pounds” (NASA 2008).
“Nano-marketing”	Smaller quantity packaged product at a lower cost to increase market penetration and hence volumes. This low cost-high impact strategy is called “nano-marketing” (Dubey and Patel 2004)

Even a well-respected science-based organisation such as NASA uses the nano prefix in a context where it is not really applicable.

More worrying is the suspicion that there is a significant group of products that actually *do* use nanotechnologies but where this fact is not stated. In the SIFO-MIORI collaboration, we have looked closely at two relevant product groups: cosmetics and textiles. These are two product groups where until recently producers have actively marketed nano-enabled products. But the advertising trends in these markets are strikingly different: More and more new textile products are marketed with some sort of “nano,” while in the cosmetics market, the number of such products are apparently decreasing if not disappearing. In Table 2, we provide some evidence based on our content analysis and web search of the American pages of the cosmetics producer Lancôme on two different dates.

This change can have several reasons: One is a growing awareness of nanoparticles in products and the potentially adverse effects. Hence, Lancôme might reduce its communication on nanoparticles altogether. Another reason could be that the cosmetics market evolves faster than most other consumer markets: The consumers in this market are used to and probably constantly expect product innovations, often communicated in a surprisingly quasi-scientific language (Throne-Holst et al. 2009). Probably this does not mean that nanoparticles are not used anymore but that the *effects* of these technologies are described and promoted, rather than the enabling technologies behind these effects. It is important to have in mind that there are currently no requirements for producers to inform consumers about whether their product contains nanoparticles. Still, the drastic reduction in matching results shown in Table 2 is remarkable.

The focus group participants were generally very concerned with the lack of information, also as a precondition for any sort of consumers’ responsibility:

“We are the ones that have to say no, we are the ones who have to choose, so obviously we need information!” (Cecilie, female, 45+)

“As of today, we—the consumers—should not be given responsibility, as long as we really don’t know anything about this” (Arnstein, male, 45+)

“This (*to inform consumers*) has to be the responsibility of the producers, not the retailers” (Hanne, female, 45+)

The right to choose In the SIFO survey, eight out of ten respondents who had heard “a little” or more about nanotechnology were not aware of any nano-enabled products on the market. This is remarkable in itself, as there are more than 1,000 products where the producers openly communicate that they contain nanotechnology. In their marketing, they highlight the improved performance that the nanotechnologies have contributed to.

Table 2 The “disappearing” nano

	22.06.2007	13.11.2008
“nano”	5	0
“nano particle”	9	0
“nano technology”	29	0

Matching results on different search terms at www.lancome-usa.com

One (re-)interpretation of the right to choose in a nano consumption context is to highlight the right to be able to choose good quality products *without* nanotechnologies:

“What about educating people about other good products?” (Cecilie, female, 45+)

“I very rarely read product declarations when I buy skin care products. So far I have only checked for animal testing.”⁴ (Dorthe, female, 25–45)

“I will start to look closer at what I am buying, because I do not want to use these things.” (Hera, female, 45+)

As these statements illustrate, our participants did not like the prospect that they would not have a choice or rather that they were uncertain whether or not they were able or *enabled* to make informed choices on this matter in the market.

The right to be heard The consumer rights are obviously interconnected. The right to be heard in this context means that after s/he is informed, the consumer might want to formulate his opinions, hopes and/or anxieties. Consumer’s right to be heard will be usually applied via consumer institutions with the necessary expertise to “voice” their concerns on a political level. Realising the lack of solid scientific evidence in the field and its complexity, nanotechnologies are not an easy field for consumer organisations to suggest knowledge-based policies. In the case of genetically modified organisms, one of the prevailing hypotheses of its supposed failure, at least in the European consumer market, was a lack of communication with the consumers. Based on these experiences, several deliberative processes on nanotechnologies involving lay citizens have been conducted all over Europe and the US. The SIFO is currently coordinating a European project (NANOPLAT) to evaluate such processes and to suggest a platform for future ones. It seems as if the lesson has been learned that consumer resistance may induce serious repercussions and that such resistance may halt the development and the diffusion of new technologies.

To have the voice of consumers mediated through consumer organisations did not seem to enter the thoughts of our participants, however. They did not, without help from the moderator, bring up the organised consumer interest in the discussions.

Policy Implications

As regards *the right to safety*, this note maintains that the regulatory framework in general, and REACH in particular, do not cover nanotechnologies sufficiently—to the surprise and worry of our focus group participants. Moreover, the different national, regional and global initiatives appear to be rather fragmented and not well coordinated. The Working Party on Nanotechnology within the OECD should increase its efforts to coordinate and spur these efforts by combining forces and making markets more transparent. As regards *the right to be informed*, there is much room for better ways of informing and educating consumers. The participants in the focus groups worried about the lack of information available to them. Governments and societal actors should encourage a societal debate over issues related to the use of nanotechnologies in products. Market transparency and continuous dialogue with industry and retailers on the supply side as well as with consumer organisations on the demand side should be promoted. Mandatory labelling requirements are another option. The latter will also support the *right to choose*. The focus group

⁴ The implication being that “from now on I have to do that in order to avoid nano products.”

participants wanted to have a choice in the market between nano-enabled products and high quality non-nano alternatives. Manufacturers should provide meaningful product information on the products and/or at the point of sale about whether product properties are derived from nanoparticles. For instance, it is not helpful if textiles are labelled to have an “antibacterial agent;” rather, the respective nanoparticle should be mentioned. Finally, *the right to be heard* has to be ensured via appropriate consumer representation—and hence adequate financial support for consumer organisations.

Referring back to our starting hypotheses, it becomes clear that consumer rights in the nano age are not self-evident but rather have to be strengthened, partly redefined and certainly revived in order to empower and protect consumers.

Acknowledgement We would like to thank our project colleagues Sally Randles and Christian Greiffenhagen at Manchester Institute of Innovation Research, as well as research director at SIFO and project leader of this project Eivind Stø for inspiring discussions and collaboration. We would also like to thank two anonymous reviewers for helpful comments. Financial support from the NANOMAT-programme of the Research Council of Norway is gratefully acknowledged (Project grant no. 182043).

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