Making Sense of Nanotechnology: The Homophilous/Heterophilous Marketer

Introduction
For B2B organizations engaged in buying and selling, how buyers and sellers construct their identities in sales relationships is critical for the cultural closeness that can be achieved and discursive sense made of high technology products. Within these sales relationships, high technology products are a known source of confusion, particularly for how technical complexity is discussed and constructed (Rogers, 2003). Interacting in the isthmus between selling and buying organizations, sellers and buyers must discursively negotiate these products, and their own identities. As might be imagined, this is no small undertaking, with nanotechnology being a pertinent example of complex, opaque, and ambiguous products. Existing between one hundred and one billion times smaller than a metre, nanotechnology products create discursive sensemaking challenges (Tolfree & Jackson, 2008). While nanotechnology is predicted to be a transformative platform for product innovation (Zonneveld, 2008), ‘nano’ terminology is no longer linked purely to scientific constructions as it has entered wider public discourses related to a host of non-nano size products (Ladwig et al, 2010). Thus a variety of discourses and cultural themes are available to construct nanotechnology products, creating challenges for sellers and buyers to discern what is scientifically nanotechnology. Compounding these challenges is the issue that there is often much varied understanding for what nanotechnology is (Boholm & Boholm, 2012), with multiple knowledge sets being used in selling and buying companies to engage with these aspects. This can result in numerous scientific and non-scientific constructions of these products, which sellers and buyers must discursively negotiate. By looking at B2B selling and buying organizations, this study offers a nuanced perspective on sales relationships engaged with high technology products, particularly for how identity is discursively utilized to influence cultural closeness and construct nanotechnology products.

Literature review
Within B2B high technology sales relationships, selling and buying is often carried out through personal selling (Slater, 2014), which has been linked to a relatively low numbers of buyers (von Hippel, 1986), where more time can be spent establishing more meaningful dyadic seller-buyer relationships. Spoken communication is commonly used in these selling and buying relationships, but is fraught with difficulties for sellers and buyers who must make sense of what are often complex technical and scientific discourses, within the confines of the sales meeting. Prior studies have shown the importance of cultural closeness as a means of legitimizing speakers and their discourses, particularly for how individuals self-categorize as part of their identity as a means of inducing closeness (McPherson et al, 2001). Problematically, identity is a difficult and somewhat slippery concept to define (Lawler, 2013), where much of what is regarded as identity is constructed through the individual, society and the culture we live in. Coupled with this is the pivotal aspect that an individual’s identity does not sit in isolation from other identities, as who we are, is intertwined with who we think others are (Jenkins, 2004). Studies such as this, which focus on closeness between identities can aid in understanding how individuals make sense of themselves in context to others (Ybema et al, 2009), particularly on how social actors discursively position themselves in marketing/purchasing relationships (Ellis & Ybema, 2010).
Previous self-categorization studies have focused on a variety of aspects for cultural closeness including race (Mollica et al, 2003), age (Feld, 1982), education (Marsden, 1987) and gender (Leenders, 1996), but with much still to unpick. Self-categorized identity can be considered critical, alongside the methodological approach to elucidate these personal and social structures, which in this study is a discourse analytic perspective. Importantly, cultural closeness is not only enacted but can be examined through discourse, and following the argument of Phillips and Hardy (2002), organizational processes require an understanding of identity from a discursive perspective, to better capture the fluidity of social life.

Homophilous relationships are constructed through culturally similar talk, and heterophilous relationships through culturally dissimilar talk (Rogers, 2003). Drawing on the thoughts of Monge and Contractor (2003), there are two lines of reasoning that support the theory of homophily. The first is Byrne’s (1971) similarity-attraction hypothesis, which argues that interactions are more likely to occur among people who perceive similar traits between themselves and others. The second is Turner’s (1987) theory of self-categorization, where individuals use personal characteristics to judge others against. In both cases, similarity is capable of inducing homophilous closeness, based on accepted cultural aspects displayed through talking, and McPherson et al (2001: 417) argued that, ‘birds of a feather flock together’.

Rogers (2003) indicates that homophilous rather than heterophilous communication is more likely to produce successful technology adoption. Problematically however, while homophilous communication can aid in sales, it is more likely for communication to be heterophilous (Coleman et al, 1966; Van den Bulte and Lilien, 2001). As a consequence of technical complexity and terminology, high technology products are perceived to bring additional challenges for individuals to make sense of these products (Mohr et al, 2011). Even where individuals may have similar backgrounds, it can be an over simplification to assume that one cultural aspect alone will result in homophily and shared sense. More explicitly, it is not enough to assume similar cultural backgrounds, such as being scientists will enable sellers and buyers to understand each other, as there are often many aspects to understand including complex product functionalities and terminology, with this often not taken into account enough in sales meetings (Probert et al, 2013).

Identity is a critical part of sensemaking (Weick, 1995), where individuals engaging in selling and buying, must utilize identities, which are enacted through relationships with others, and positioned through what is said. Briefly, sensemaking is orientated towards understanding organizations, where how people understand the world is a key factor, where sense given and made between individuals is subjective knowledge drawn on through discourse (Ellis & Hopkinson, 2010), where sense is given by one person to another (Gioia & Chittipeddi, 1991). Discursively sharing knowledge can be part of legitimizing a community, and constructing boundaries to incorporate group members and exclude others. As Ellis and Hopkinson (2010: 414) argued ‘thus the production and display of particular forms of knowledge is at once a sense-making act and an act through which identity is claimed’.

Pulling this section to a close, the themes emerging from the literature and most relevant to this study are driven by the construction of seller/buyer identity in the sales relationship, and how this influences heterophily/homophily. Where technical complexity is encountered and potential heterophily, the use of linguistic tools and cultural resources may provide a route to homophily, with all of these aspects being examined in this study.
Methodology
This study sought to better understand the use of spoken marketing communication on cultural closeness between buyers and sellers engaged in nanotechnology B2B sales. Fourteen respondents, consisting of seven sellers and seven buyers were identified within the nanotechnology sector in the UK, to produce a purposeful sample of ‘experts’ to engage with through semi-structured interviews (Wengraf, 2004). This study was carried out using a qualitative case study methodology (Yin, 2009) using discourse analysis (Wood & Kroger, 2000) as a means to give the respondents a voice to speak about their selling and buying experiences (Billig, 1996). Through the use of a discourse analytic perspective the first author as the researcher functioned as an active participant in the interview process, co-partnering the construction of meaning alongside the respondents, to more fully capture the richness of their experiences. In particular, the following themes were explored including, the influence of identity on cultural closeness, technical complexity and cultural closeness, and the use of discursive tactics to make sense of nanotechnology products via homophily, with interview questions being shown in Appendix 1.

Through this methodological approach, a total of over thirty-five hours of recorded data was produced, with transcription occurring within twenty-four hours after each interview to maintain the integrity of what was said (Eisenhardt, 1989). From transcribed data, content analysis was carried out to highlight emergent themes against the aims of this study, before moving on to use this data as a means for full discourse analysis (Wood & Kroger, 2000). To aid in the reliability and quality of the worked data, warranting was carried out to provide a contextual understanding of the justification of claims made (Wood & Kroger, 2000). In practicality this involved all three authors reworking the data several times, and looking for themes within each interview and between interviews, to ensure a high level of inter-coder agreement. Where clarity was needed, the respondents were sought to aid the claims being made. For further details of interviewees, see Appendix 2.

Data analysis and interpretation
Identity driven heterophily/homophily
All fourteen respondents claimed that high technology products raise frequent sensemaking challenges, particularly within the arena of nanotechnology. These challenges were linked most prominently to the technical aspects of such products, and complex language that could be misunderstood. Interviewing only scientist sellers and buyers provided an opportunity to examine what might be considered a high-level of homophilous communication. However, although all respondents self-identified as scientists engaged in selling and buying, as ‘sellers’ and ‘buyers’ difficulties were often spoken about for different ways of constructing products based on different knowledge sets being used by different scientist types, such as between chemists and biologists. More explicitly, this suggested that there were propensities to use perceptual framing based on held knowledge, which could create confusion between sellers and buyers, while at the same time being more easily understood by the speaker, as their discourse was linked to their knowledge. The beliefs the respondents held as scientists, also influenced the way marketers were viewed, including marketing practices and discourses, which were commonly constructed as deceitful. Discussing this aspect, Buyer B commented, ‘Let’s be honest here, marketing is all about lying to people, out and out propaganda, no scientist can do that, we might lie but cannot be seen to be doing it’. Positioning themselves as scientist sellers and buyers, set science as ‘truthful’ and marketing as ‘deceitful’, resulted in claims being made that marketing language was avoided. Seller F gave an example of this, claiming: ‘Use the five P’s? You must be joking! No one would ever believe me again! I have to find ways to sell without looking like a seller, or at least I can as long as I look like a scientist seller’.
It is too simple to imagine that there is a singular notion of the scientist, with much of what is considered a scientist being contested and negotiated throughout the sales relationship. As Seller D commented, ‘Yes we are both scientists, but every discipline has hierarchies. So I’m a chemical biologist, and let me tell you, this is much better than being a biochemist. We all have our own ways of describing the same things!’ Power was an important theme for whether more nuanced identities would be enacted through talking, where as Buyer B suggested, ‘We really need to get on and understand each other, but if he hacks me off, well I’ll pull rank, and move to a more technical language than the seller understands. I buy from him, and I have the power’. Buyers positioning themselves as more powerful in the dyadic sales relationship was common, and was confirmed by sellers, who claimed that their focus was more on the act of selling. This was argued by Seller D, ‘Hah! Of course we can play these silly school games, where he wants to show off his technical language, shows he is the big scientist. Let him. I’d rather we didn’t, as we are here to sell goods’. Enacting further nuanced identities beyond the scientist, such as biochemist, physical chemist or molecular biologist for example, suggests a way to use more powerful discourses, and appears used more by buyers than sellers. The detriment however, is that by doing so, moves conversations that are predominantly perceived as homophilous and as more easily making sense into heterophily and poorer sensemaking. Expanding on this, Buyer A commented, ‘Promoting myself as the uber scientist is good for my ego, but bad for buying. I can play games, but ultimately I have to come back to negotiating, and I’ll do that as the plain old scientist buyer’. The notion of game playing is potentially an important aspect, as changing from being a scientist, to an identity of a nuanced scientist such as a physical chemist, was also argued by other respondents as potentially increasing cultural distance through identity and power, which can hinder sensemaking and sales. More simply, positioning oneself as the scientist seller or buyer can be advantageous for sensemaking through homophily, where the dyadic relationship is constructed more equally, as opposed to using nuanced identities to increase power for one party.

**Technical complexity and heterophily**

Nanotechnology is immersed and constructed through technical discourses using easily misunderstood scientific terminology and concepts. As might be expected, the use of technical discourses can move sales discussions into heterophily and poor understanding, as commented on by Seller E, ‘The more technical we get in what we say, the more chance there is for confusion’. The overly simplistic view that all scientists use the same words to describe the same products is not one supported by this study. Expanding on this, Buyer B stated: ‘Different ways of saying the same things? Yes! For example, I want DNA. We both get this. I say deoxyribonucleic acid? Double helix? He might not. We have to work it out together and use what we all view to be the most accessible language’. This suggests a level of negotiation and reflexivity within sales, where sellers and buyers co-author discourses to enable sensemaking, where what is said is most easily understood. Thus being overly simplistic can be just as problematic as being overly complex in the terminology used. As Buyer A said, ‘Hmm it reminds me of Goldilocks and the Three Bears, you are looking for the one that is just right’. This can be directly linked to sensemaking, where the speaker and giver of sense must be aware of what they are saying, and seek to produce talk that will elicit the response in the form of sensemaking from the other party to what was intended. In practicality, both seller and buyer are pivotal parts of the dyadic sales relationship, where both must work to construct product views that make enough sense to both parties.

**Linguistic tools, cultural resources and homophily**
All respondents discussed that relying on technical discourses and concepts was not enough to keep conversations within homophily, even though they all identified as scientists. In practice, discourses were claimed to be predominantly homophilous but with heterophily and poor sensemaking never being far away. Sellers and buyers dealt with this by claiming to use linguistic tools such as metaphors that could be linked to well known cultural references including science fiction. Detailing this, Seller C stated, ‘It isn’t possible to rely on science talk alone, as there is always a point where we get confused. Use simplification, and what is well known, and understood, well it gives a way for us both to understand each other’. Using simplified and culturally known discursive resources within the sales relationship thus appeared as vital. Care was needed so that used discursive tactics did not produce further confusion and sensemaking challenges, again emphasizing the need for well known and understood cultural references. Looking at an example of this practice, Seller E, commented, ‘I’m trying to sell a complex drug that the buyer won’t understand. So the drug is an X-Wing Fighter from Star Wars, and it destroys bad stuff, the Death Star, leaving the rebel alliance safe, which is the patient’. This tactic not only has the potential to use powerful and well known imagery, where notions of the product are constructed as good, but the targeted area as bad. Coupled with this is the potential for the sensemaking recipient to tell this story to others within their organization, facilitating sensemaking throughout the organization, particularly for non-scientists. In line with a sensemaking perspective, these practices do not seek to produce discourses that are technically correct but only ones that are easily understood, and are preferred to the more technically orientated discourses.

Discussion
It appears pivotal to selling and buying nanotechnology products that the legitimization from the scientist seller or buyer, with other scientist sellers and buyers is recognized. Where a variety of products are sold, it appears that being a scientist is more important than identifying as a particular type of scientist, such as a chemist or biologist. For sales relationships, sellers and buyers who position themselves as scientists can induce a sense of belonging within an elite group, carrying out business activities, setting non-scientists and what are perceived as non-scientific discourses as ‘other’. Within the ‘group’ composed of scientist sellers and buyers is the use of what is claimed to be homophilous discourses, which facilitate sensemaking. This is an important part of selling and buying, for facilitating sense to enable decision-making for whether to buy or sell. Enacting more nuanced identities of the scientist, such as the chemist or biologist through technical terminology should be treated with caution, for the ability to move conversations into heterophily and poor sensemaking. The choice for whether to enact further identities is complex, but can be beneficial for sellers and buyers, who have similar experiences for example, both as chemists, providing greater opportunities for homophily and closeness. At present, the decisions for what identity to enact is argued as being made by the buyers and sellers through implicit and explicit discourses in the sales environment, with claims being made that managers are active in discussions about identity and discourses used.

Valuable new insights have been provided by this study for B2B sales relationships, and particularly for identity and discursive homophily/heterophily. While prior studies have claimed the ability to build homophily on numerous cultural aspects (Feld, 1982; Leenders, 1996; Marsden, 1987; Mollica et al, 2003), this is the first study that has examined homophily based on self-identification of scientist sellers and buyers. Examining scientist sellers and buyers has demonstrated a group that uses an identity contrary to their role as sellers and buyers, where language associated with selling, buying and marketing is dismissed as damaging to their central identity of scientists. It is perhaps too easy to assume that these individuals do not engage in marketing discourses, as from the findings there is much to suggest that they do. As
they feel they cannot use what is more commonly regarded as terminology associated with marketing, new ways of speaking have been imagined and enacted in line with the central identities. Thus, it might be better to regard these individuals as having enacted new identities (Goffman, 1990) as the ‘scientist seller’ and ‘scientist buyer’ through their dyadic relationships with other scientist sellers and buyers.

Finally, this study has showcased the potential for nuanced shifts into heterophily by any language and terminology not well understood, which has facilitated the use of linguistic tools and well known cultural resources, to facilitate sensemaking. This aspect may have much value within B2B sales, and while this study only examined scientists who sell and buy, the respondents claimed to have dealt with non-scientist sellers and buyers, where heterophily is more likely. In line with a sensemaking perspective, using these discursive tactics can offer simple routes to understand, but also to tell stories about what has been said, and to provide answers for decisions made. Importantly, this moves discourses away from examining what is technically correct, but preferred and easier to understand by individuals with varying knowledge sets, even where all parties are scientists.

Conclusions
Findings indicate that sellers and buyers within B2B nanotechnology companies are acutely aware of the difficulties for what to say about high technology products, including nanotechnology, and the resulting challenges of sensegiving and sensemaking. This sample suggests a high propensity for scientists to be employed as sellers and buyers, who predominantly identify as scientists and use discourses they believe to be acceptable through the lens of being a scientist. The rationale for employing scientists in these roles is due to the knowledge these individuals can bring as scientists to negotiate technically complex discourses. Perhaps one of the most valuable attributes is the ability of the scientist seller or buyer to know when to use technical terminology, and when to simplify and use alternative discursive tactics. All respondents claimed to exist in a predominantly homophilous relationship based on their identities as scientist sellers and buyers, but with a potential for conversations to move into heterophily. Such shifts appeared to occur as a consequence of the respondents enacting more nuanced versions of their identities as scientists, and usually for the buyers to induce power through using technical terminology not known by the sellers. This aspect, was detailed as being a game, but was considered unhelpful for homophily and sensemaking by both sellers and buyers, and with a need for both parties to re-orientate conversations back to homophily and better sensemaking. Using marketing or business terminology with other scientist sellers or buyers was avoided due to inducing an otherness about their scientist identities, which could be viewed as spoiled by drawing closer to business discourses, and capable of inducing heterophily. The main vehicle for attaining homophily and sensemaking is through the use of linguistic tools and well known cultural references, where sense can be made, detached from the functionality of a product, with little need to make sense of how the product really works. This also appears to solve the problem of sellers and buyers needing to detail technical aspects to non-scientists within their companies, with the discursive tactics already having been created through linguistic tools and cultural references in the sales relationship.

References


Appendix 1 – Semi-structured interview questions

1. What is your role within your company?
2. Could you tell me about your identity?
3. How does your identity impact on selling and buying within this company?
4. Could you tell me about selling/buying within this company?
5. What high technology products do you sell/buy?
6. What value do you place on understanding the products you buy/sell?
7. How is marketing communication used in selling/buying?
8. Who controls spoken communication used?
9. What is your perception of spoken communication to make sense about products?

Appendix 2 – List of interviewees

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<th>Self ID</th>
<th>Academic background</th>
<th>Professional background</th>
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Abstract
The pervasive use of complex technical terminology and concepts within B2B nanotechnology sales relationships has resulted in numerous sensemaking challenges for sellers and buyers. Using a discourse analytic multiple case study methodology, fourteen self-identified ‘scientist’
sellers and buyers from different nanotechnology companies, were interviewed to better understand how culturally close (homophilous) or culturally distant (heterophilous) sales talk influences sensemaking. With all respondents enacting centralized identities as scientists engaged in selling and buying, sales discourses were predominantly claimed to be homophilous. However, poor sensemaking was still evident when poorly understood terminology and themes were used, often from specific talk related to being a particular type of scientist. Focusing on how sellers and buyers worked towards maintaining homophilous sensemaking, showed the joint use of linguistic tools such as metaphor, and references from popular culture, where specific technical knowledge could be avoided. While these spoken tools cannot necessarily create ‘true’ technical understanding, they can provide simpler and preferred views of easily misunderstood high technology products, where being the scientist is enough to achieve a functional level of homophily for sensemaking. This study suggests a highly nuanced and negotiable marketing practice between sellers and buyers to enable increased sensemaking of high technology products.