Talking about transplants: Social representations and the dialectical, dilemmatic nature of organ donation and transplantation

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In many westernized countries, organ donation rates are low in comparison with the need for life-saving organ transplants, and are at odds with generally high community endorsement of organ donation. This is particularly true for Western Australia, the location of this study. This contradiction between endorsement and donation is investigated within a framework that draws from Moscovici’s (1984) theory of Social Representations, Guimelli’s (1998) differentiation between normative and functional dimensions of the central core, and Billig’s (1988) rhetorical position on the role of argumentation in discourse. Four focus group discussions on organ donation and transplantation were conducted. Analysis of the discourse suggests that the social representation of organ donation and transplantation can be understood best as a representational field organized around two dialectically ‘opposed’ images—the gift of life and the mechanistic removal and replacement of body parts. The normative and functional expression of these two images as a pro-donation stance and a qualified pro-donation stance is discussed, as is the role of argumentation in the production of a social representation.

In Australia, a widening gulf exists between organ donation rates and the number of people requiring life-saving organ transplants. Despite this, market research (see Dye, 1995; Frank Small & Associates, 1995; Quadrant Research Services, 1991) continues to document that the majority of people in Australia support the idea of organ donation, leading to the expectation that this high support should translate into correspondingly high donation rates. Yet, Australia currently has one of the lowest donation rates in the western world, and a trend that has seen donation rates drop over the past 5 years. For example, the number of organ donors in Australia has dropped from 183 in 1994 to 164 in 1999. Nationally, 59 people are currently waiting for a heart transplant, 73 for a lung transplant and 1531 for a kidney transplant.

In an attempt to address this disparity between perceived intent and actual donation, health campaigns frequently aim to educate the public about the ‘facts’ of organ donation and transplantation, assuming that lay understanding will reflect medical knowledge of the issue. And while scientific knowledge, such as medical knowledge, and lay understanding of that knowledge can be understood as being on the same

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continuum, each is culturally specific (Bangerter, 1995) and shaped by its own representations that determine what is “foreground in the perception of reality” (Farr, 1995, p. 96). In this paper, we argue that it is the reality of organ donation and transplantation in the non-medical world that is crucial to understanding the donation dilemma. We use the theory of social representations to elaborate this position.

Central to the theory of social representations (Moscovici, 1984, 1988, 1998) is the premise that our understandings are first and foremost social in origin—as “certain patterns of thinking, action and interaction which, when collectively concerted, create and construct a social object” (Wagner, Valencia, & Ezebarrieta, 1996, p. 332). This does not exclude individual experience or perception; rather, it acknowledges that our understandings have their origins in mutual interaction (Moscovici, 1998). Conceptualized as a social representation, organ donation becomes more than an individual’s attitude or decision; it is a shared understanding constructed and shaped by the exchange and interaction processes that operate within society.

Shared representations, their language, penetrate so profoundly into all the interstices of what we call reality, that we can say that they constitute it (Moscovici, 1998, p. 245).

Social representations theory is constructivist in its definition of reality. There is no ‘given’ reality: individuals and their social groups produce reality through shared discourse and interaction. Also, it is through the processes of social representation, effected through anchoring and objectification, that reality is constructed (Duveen & Lloyd, 1990; Hick, 1998). Hence, social representations construct both the realities of social life and our understanding of it (Duveen & Lloyd, 1990), such that the social representation is the ‘object’, not a representation of it (Wagner, 1998).

Thus, within the parameters of social representations theory, social reality has certain defining characteristics. Social reality is historical, in that the significance of the past is emphasized in the construction of the present; inter-relational, in that the construction of reality involves the physical and discursive interaction between people in their physical and social environments; and dynamic, as there is never an underlying absolute reality, or a reality free of its socio-historical context (Pankhurst, 1993).

We believe that the pervasiveness of the past in the construction of the present is especially pertinent in how organ donation and transplantation are currently understood. The genesis of the social representation of organ donation and transplantation was undoubtedly the medical world. However, the transition from being exclusively a medical procedure, known and understood only by the medical profession, to a medical procedure making sensational headlines around the world, ensured that it would be understood in non-medical terms, imbued with non-medical beliefs, values and knowledge.

During the late 1960s and early 1970s, the social representation of organ donation and transplantation, in Western Australia, was focused around the medical world, in particular the mechanistic conception of the body, and the pivotal role of the transplant surgeon in the success of the transplant operation (Moloney & Walker, 2000). Organ transplants were primarily understood as the removal and replacement of body parts by a transplant surgeon, which relegated the donor to that of a ‘spare part’. At the core of the representation was the notion of life; the new life that was given to the recipient by the transplant surgeon. In the early 1980s, the transplant procedure was anchored in the non-medical world, in particular the donor and the donor’s family. Transplants were now being understood as the ‘gift of life’; the gift of life from a donor
to the recipient. Now both life and death were central to the representation, and the donor and the recipient were being portrayed as integral to the transplantation process. Both these interpretations were present in media reports in the 1990s, suggesting that the social representation of organ donation and transplantation could be understood best in terms of a representational field that centred around two conflicting images—a ‘gift of life’, and the “medical removal and replacement of body parts” (Moloney & Walker, 2000). Hence, the purpose of the present study was to investigate further the nature and diversity of the representational field, suggested by the previous study, by looking at how people talk about donation and transplantation.

The existence of a representational field with conflicting images can be interpreted within ‘core theory’ (see Abric, 1993, 1996; Guimelli, 1993, 1998), a position that has generated a great deal of research concerning the structure of a representation; and which was our initial theoretical position for the present study.1 It has been demonstrated that, structurally, the representational field is made up of two categories of elements, core and peripheral, that play different roles in maintaining the representation. The core elements generate the overall meaning and determine the representation’s organization, while the peripheral elements allow the core elements to become reality by serving as an interface between the core elements and the actuality of the world (Abric, 1993). Implicit within this conceptualization are the notions of cohesion and coherence, both within the core and the representation as a whole.

The [core] elements generate the meaning of the representation and determine its organization. Their role is therefore essential in the representation. Furthermore, the central elements are characterized by a high degree of stability and are consequently inflexible and resistant to change. Finally, they constitute to a large extent the area of consensus concerning the representation (Guimelli, 1998).

The notion of cohesion and coherence within a representation is at odds with findings from our previous study (Moloney & Walker, 2000), which suggested that the social representation of organ donation and transplantation may be understood best as a representational field with two dialectically conflicting images. Moreover, the idea that the core of a representation is stable, cohesive and coherent suggests stasis. This is difficult to reconcile with the processes integral to the formation and transformation of this representational field over time (Moloney & Walker, 2000). The representational field we found to exist in the 1990s was a composite, suggesting that past understandings had been integrated with more recent understandings, creating conflicting images about the same social issue. This suggests a fluid, negotiable conceptualization of the core. This is in keeping with recent research demonstrating that the core elements of a representation have a differentiating, non-equivalent character that is hierarchically organized into normative and functional dimensions (see Abric & Tafini, 1995; Moliner, 1989; Rouquette, 1994, all cited in Guimelli, 1998). We present a brief summary of this research here.

**Normative and functional dimensions of the core**

In research into the social representation of the ideal group, Moliner (1989, cited in Guimelli, 1998) found that two core elements, ‘Friendship’ and ‘Equality’, were

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1When we talk here of images, we are referring to the iconic image of the representation (see Moloney & Walker, 2000).
identified as being essential to how the notion of the ‘ideal group’ is socially understood. If the ideal group was described in terms that contradicted these elements, the notion was no longer recognized as the ideal group. In contrast, when the ideal group was described in terms that contradicted one of the peripheral elements, the ideal group was still recognized as such.

The results show that when a central element was called into question, the subjects no longer recognised the object. In this case, there was thus a collapse of the global meaning specific to the object of representation which was not the case when a peripheral element was called into question (Guimelli, 1998, p. 210).

Moreover, the two core elements, ‘Friendship’ and ‘Equality’, were found to have a difference in status within the core. Friendship appeared to be a more decisive element in the representation than Equality, which appeared less unconditional and more negotiable. This led to the conclusion that the central core is composed of normative and functional dimensions differentially activated depending on the social context or the practices of the social groups. The normative elements appear to play a more fundamental role in the internal functioning of the representation. The functional dimension is described as being concerned with the relations that individuals maintain with the social object. These are directly related to social practices developed in relation to the social object, whereas the normative dimension is associated with ideological and historical factors, and linked to the values and norms or stereotypes that are salient within the group (Guimelli, 1998).

The differential activation of these two dimensions was demonstrated by Abric and Tafini (1995, as cited in Guimelli, 1998) using the method of ‘induction by ambiguous scenario’. Investigating the social representation of ‘the firm’, five central core elements were identified: ‘the firm is a group of people’; ‘its aim is to make a profit’; ‘it is a hierarchical group’; ‘it produces goods or services’; ‘it is a place of work’. Subjects rated each of these elements on both a normativity index (defined as the perceived importance of an element’s contribution to the judgments made about the object) and a functionality index (defined as the perceived importance of the element’s contribution to behaviour relative to the object of representation). ‘Hierarchy’ and ‘Profit’ were found to have higher mean scores on the normativity index, whereas ‘Work’ and ‘Production’ had higher scores on the functional dimension. The degree of activation of the normative elements was also much higher than that of the functional elements. Subjects who had no practical experience of the ‘firm’ referred only to the normative dimension, but for students with a direct relation with the ‘firm’ (a considerable amount of work experience in firms) the functional elements were characterized by a high level of activation to the detriment of the normative dimension.

**Relevance of this research to the present study**

In presenting this research, we acknowledge its experimental nature, and its dependence on laboratory conditions. We also recognize that, as such, it presents a static view of a social representation, and appears to ignore the symbolism and dynamism so quintessential to a social representation. However, our aim in presenting this research is to demonstrate the plausibility of the coexistence of conflicting core images within one representational field by highlighting the possible mechanism that would allow this accommodation—that of the differential activation of the normative and functional dimensions of the core. The intention of this study is not to investigate this differential
activation within a controlled laboratory session. Rather, we are interested in the hypothesis that conflicting images do exist within one representational field and, thus, the nature and diversity of the representational field that this suggests within the context of everyday discourse about donation and transplantation.

This hypothesis of coexistence becomes more plausible if we consider how social representations constitute social reality. Within a social representation’s framework, social reality is historically constructed; what is perceived to be present-day understanding of a social issue is in fact the product of the evolution of representations. If, as in the case of the social representations of organ donation and transplantation, two ways of understanding this social issue evolved at different periods in time, the coexistence of both in present-day reality is highly plausible; more so if each is differentially activated depending on its role within the representation. Recent research by Gervais and Jovchelovitch (1998) supports this. In their study of health and illness in the Chinese community in England, they found a ‘hybrid’ representational field that combined traditional Chinese medical traditions with current biomedical knowledge. This is a representational field that has clearly evolved over time. Similarly, in a study of traditional thinking and modern thinking about madness in India, Wagner, Duveen, Themel, and Verna (1999) found a representation of traditional faith-healing coexisting with an embryonic representation of modern psychiatry. However, this later study interpreted their findings as two contradictory, but separate, representations.

The purpose of this present study is to investigate the meaning of organ donation and transplantation within society. Specifically, we focus on the nature and diversity of the representational field suggested in a previous study (Moloney & Walker, 2000), paying special attention to the hypothesis that two conflicting images of organ donation and transplantation—a ‘gift of life’ and the ‘removal and replacement of body parts’—coexist within one representational field pertaining to both donation and transplantation (Moloney & Walker, 2000). Of importance here is the medium used to examine this. If we are to be guided by the dictum that “understanding arises from social communication” (Moscovici, 1984, p. 15), we need to investigate a medium that is at the interface between the individual and society, and a medium that allows “the research [to be] interested in the stock of arguments produced rather than the individuals producing those arguments” (Farr, 1995, p. 6). Both these positions suggest the discussion group, “the thinking society in miniature” (Farr, 1995, p. 6).

**Method**

Four focus group discussions were conducted in the latter part of 1996. The same procedures were used for all groups.

**Sample selection**

The aim of the selection process was to recruit 10 potential participants per group. This is in keeping with Stewart and Shamdasani (1990), who advise that a focus group should have between 6 and 12 members, and that 2 extra individuals per group should be recruited to counteract natural attrition caused by unforeseen circumstance. In the end, the four groups had 8, 7, 9, and 5 members, respectively. Potential group members were selected randomly from the electoral rolls of two electoral districts close to Murdoch University, where the group discussions took place. These electoral districts contain a range of socio-economic classes and ethnicities. Potential participants were
contacted by letter and telephone, and invited to participate in a group discussion on organ donation. This procedure of randomly selecting participants from the community is rare in this kind of research. We chose this method in order to ensure that a wide selection of views in the community were represented in the group discussions, and because, ultimately, any intervention designed to increase donor rates must address the whole range of views available in the community.

Sample description

In total, 29 members (15 male, 14 female; mean age 48.9 years (range 22–79 years)) attended the four focus group discussions. Of these, 24 reported that they had children, and 11 indicated that they belonged to some formalized religion (four were Catholic, two Church of Christ, one Sikh, and one Hindu); 26 members were Australian, one was Italian and one was English, with the majority having spent over 16 years in Western Australia.

Classified according to the seven super-groups of the ASCO Occupations Classifications standard (ASCO, 1982), one member was classified within the Managerial and Administrative Occupations, eight within the Professional and Related Occupations category, six within Clerical Sales and Service Occupations, and six within the Manufacturing and Construction Occupations. Five members specified that they were engaged in Home Duties or Home Duties and/or part time employment, and five stated that they were retired. Three members chose not to specify their occupations.

Twenty members had indicated on their driving licence or on a donor card that they wished to donate their organs. Fourteen members had previously donated blood, and one had donated an unspecified bodily substance.

In Western Australia, there is one morning newspaper, the West Australian, and one Sunday newspaper, the Sunday Times. The national morning newspaper is The Australian. When members were asked about the newspapers they read, the preferred newspaper was the West Australian, with the West Australian singularly and the West Australian together with the Sunday Times, being the newspapers that most members read.

Focus group procedure

All focus group discussions were held in the same room at Murdoch University, and conducted by the same moderator (the first author). All discussions were video- and audio-taped. Owing to the random nature of the selection process, group members had not met each other before the focus group discussions; therefore it was important to create an environment that was as non-threatening and conjugal to discussion as was possible under the circumstances. This involved the use of armchairs arranged in a circle, the provision of light refreshments on arrival, and the discreet placing of video- and audio-taping equipment. On arrival, group members were greeted and given light refreshments. They were then invited to complete a voluntary background questionnaire and an informed consent form while they waited for the remaining members to arrive. Everyone was thanked for attending, and issues relating to the aim of the research, and to impartiality and confidentiality, were discussed. Following this, group members introduced themselves.

To set the scene for, and to facilitate, group discussion, a structured initial opening was used. This consisted of seven short newspaper extracts pertaining to organ
transplants and donation being read to the group. These were taken from the *West Australian* newspaper and detailed incidents where organ donation was a possible course of action. For example, the first two newspaper extracts read as follows:

In Stamford, Connecticut, the mother of a 26-year old shooting victim has refused to give doctors permission to use her son as a donor for a heart transplant operation at Maimonides Hospital in New York.

In Houston, Texas, Everett Thomas (47), who received the heart of Mr Charles Martin (15), at St Luke’s Hospital, was able to receive close friends in the hospital. She could not talk but was able to nod her head. Mr Martin’s heart was removed about nine hours after he shot himself in the head with a 0.22 in pistol, causing what doctors agreed was irreparable brain damage.

The members were then told

These newspaper clippings illustrate some of the difficult decisions that must be made when organs are to be donated from one person to another. Often those decisions are made quickly, and often by people who haven’t given much thought to the issues involved before they have to make that decision.

They were then asked:

Can I ask you what some of the issues are that come to mind when you think about the idea of donating your own body organs, or donating the organs of someone close to you, someone you love?

The discussions that followed were unstructured and reflected the different interests of each group. Seven standard prompts were used if, and when, the discussion began to falter. These were based on previous research (see Moloney & Walker, 2000). It must be stressed that the aim of the research was not to compare discussions across focus groups; it was to sample the stock of arguments available in social thinking (Farr, 1995). Therefore, while a standard introduction was used, the prompts, although the same, were used with discretion to prompt, as opposed to direct, the discussions.

**Characteristics of focus group data**

The focus group produces data with the distinguishing characteristic of being generated through group interaction (Asbury, 1995; Morgan, 1996; Sim, 1998). The verbal contributions of the group members are stimulated by the dynamics of the group interaction (Asbury, 1995). The data generated are, therefore, context-specific, and comparisons cannot be drawn between different focus groups. The enumeration of viewpoints is invalid, as is determining the veracity of a viewpoint by the strength of its articulation within the group. A different group will create a different dynamic, giving rise to the different expression of viewpoints, both numerically and in their strength of argument (Asbury, 1995; Morgan, 1995; Sim, 1998). By the same token, however, the group dynamics that produce these data also allow the types of thinking that circulate in society about the research object to be sampled, which include shared conflicting, as well as shared consensual, views. Thus, as long as the point of ‘saturation’ (Asbury, 1995) has been reached across groups—where no new ideas or issues are forthcoming from the group discussions—an investigation of the types of issues raised and the construction of the debate about the issues across groups should yield rich data about the research object.
The other noteworthy feature of data generated through group interaction relates to sequencing in the discussion (Reed & Roskell, 1997). The responses produced in a group discussion are a function of the discussion itself; they are constructed through the process of debate. Responses that occur early in the discussion can be quite different from those that occur during and at the end of the discussion, indicating that the sequencing of the debate is itself an important datum.

**Analysis**

The four focus group discussions were transcribed into text for use with NUD.IST 4.0 software (Richards & Richards, 1995). This software package is suitable for handling large amounts of unstructured data in a flexible manner. It is also suitable for inductive analysis, as it allows the data to be indexed in more than one category, and for categories to be continually adjusted to reflect the progress, as opposed to the mechanics, of the analysis.

The overall aim of the analysis was to investigate how people talk about organ donation and transplantation. The focus was on building a composite picture of how this is discussed. Hence, the initial analysis was directed at investigating the types of issues raised, and the construction of the debate around these topics, in particular the arguments used, and dialogue that could be regarded as ‘common-sense’—dialogue that appears so sensible that it is rarely challenged and is often used to support a particular argument or position (Billig, 1997). The analysis was inductive, and no prior categorization was imposed on the data. The transcripts were read and re-read again before being coded into the types of issues raised. The arguments around each issue were investigated and interpreted within the context of each group discussion, and collated across groups.

**Analysis and discussion**

A social representation can be understood as an interpretive framework in which collectively concerted patterns of thinking, action, and interaction create a social object (Wagner et al., 1996). This suggests that an investigation of the social representations that are expressed within discourse would be directed towards the patterns of thinking underlying the discourse, and not to characteristics of particular individuals producing the discourse. For this reason, when we present quotes from the group discussion, we do not provide much detail about who produced the words we quote. Nor do we analyse patterns within individuals across the course of discussion. Our concern, rather, is with the collectively and interactively produced discourse itself.

Each of the four focus group discussions lasted between 1.5 and 2 h, and yielded immensely rich data. Our analyses focus on, in turn, the sequencing of the focus group discussions, the nature and diversity of the representational field, and, lastly, the nature of debate and argumentation in social thinking, and its relationship to social representations.²

² Guilleni's (1998) paper discusses the solicitation of the normative and functional dimensions of a representation in relation to the representation's core elements. In presenting our findings, we use the terms frameworks or understandings interchangeably. By this, we are referring to the iconic image associated with each understanding, not the core elements per se. However, core elements cannot be divorced from the socio-genesis of the representation, because it is through the interdependent processes of anchoring and objectification that the representation takes structure. We discuss our findings in terms of the images that were conveyed through the objectification of the representation. We do so because we wish to present the findings in a manner that reflects the discourse, and is in keeping with the aim of this study 'to investigate how people talk about organ donation and transplantation'.
**Sequence of the discussions**

The groups followed a similar pattern in the sequencing of the discussions. While this was due, in part, to the manner in which the focus groups were conducted, the similar structure of the discussions does highlight how the dynamic nature of discussion is an integral process in social thinking.

In the opening stages of the discussions, two or three members of each group voluntarily stated their own position on organ donation. Although expressed differently, in that some were qualified statements, all of the stated positions favoured organ donation. This appeared to contextualize the ensuing discussions. Although the discussions that followed debated issues concerning or qualifying the idea of organ donation, they were conducted within the already established pro-donation context. Within this context, a member would raise a point—be it a concern, a doubt, or uncertainty—and look to the group for either confirmation or clarification of how they felt, or reassurance through negation of a concern. In response, many facets, supporting and non-supporting, associated with that point were raised by the group, including the member who had initially raised the point. This often resulted in a counter-posing of the point raised. This suggests that, despite an initial pro-donation stance, most members of the focus groups had concerns and doubts about organ donation, and that most focus group members had knowledge of the differing arguments associated with organ donation. These issues or concerns can be categorized loosely into the following categories, none of which is exclusive:

- The nature of death
- Scepticism of the medical profession
- Concern over the next of kin’s rights in the donation process
- Relationship of religion to donation
- Disfigurement caused through donation
- Trade in human organs
- Reciprocal nature of the donation
- Knowledge of the recipient
- Donation and its parallel to adoption
- Donation and the child
- Technology and its relation to donation and transplantation.

The following is an example of the type of debate that characterized the discourse across these categories.

**Context:** Talking about next-of-kin having the right to donate their loved one’s organs (Group 1)

If it came to him, he [her husband] would like his organs to be donated so I guess that would influence me although the thought of them cutting up his body terrifies me and I find it very distasteful to say the least. But what would influence me even further is that if he was ill or needed a donor organ, I would hope that somebody else would donate theirs, so that would influence me. (Woman 1)

It brings up the question. Would you have your husband cremated? (Man 1)

If that is what he wished to do. (Woman 2)

He is just pointing out that that is just total destruction, if you follow me. How do you know, it seems to be a milder version of the other. (Man 2)
I guess so; it is all mutilation. I just find it quite chilling. To be worried about if they are sure or not. I know that these days they are sure. (Woman 1)

I think in one of those instances, you have got to make a decision. I mean where there is brain damage like the person had, and presumably the organs were taken and even probably mutilated before, what you would call death. (Man 3)

These qualifying arguments were related either to how that member felt, to what they understood about the issue, or to a vicarious account of how that member understood someone else to feel or have experienced the issue. Nearing the end of the discussions, each member was given the opportunity to add anything else to the discussion, or to talk about what they considered to be the main issue in relation to organ donation and transplantation. Most members took this opportunity to again state a favourable position towards organ donation and, again in many instances, to qualify that position.

Yeah, I suppose I am in favour of organ donation and to the point of it being mandatory and some sort of registration with the opportunity to opt out if you have good reason . . . I believe the medical profession perhaps needs a bit of guidance . . . on where they are going and what they are achieving and in a lot of cases perhaps being a little more selective in the way they apply the technology. (Man, Group 4)

It is very enlightening and uncompetitive to agree to donate organs. Previously I thought I was far too old to even consider it for myself, but I am not sure about it if I have to make a decision to volunteer other people’s organs whether I could do that. (Man, Group 3)

I agree with Peter (above comment). I think it is a wonderful idea if you can help somebody, and I mean when you are gone you are gone. (Woman, Group 1)

During these closing comments, members appeared to reach a degree of consensus over the different positions that had been posited during the discussions. There was also the ‘feeling’ that the discussions had been worthwhile and had achieved something. This appeared to be due to the process of members confronting differing points of view, and through the discussions reaching a consensus that there were concerns and issues about donation and transplantation.

**Nature and diversity of the representational field**

Three points can be drawn from the analyses that address the nature and diversity of the representational field.

**The majority of participants endorsed the practice of organ donation**

When members of the focus groups talked about organ donation and transplantation, it was within a pro-donation stance. Organ donation was understood to be a worthwhile, altruistic act that benefited others and humanity. A donated organ was a gift from one human being to another, a ‘gift of life’ that enabled another person to have a second chance at life, a life that would have otherwise been ‘prematurely’ shortened. This was taken as a given—as common sense—within the focus groups.

I suppose the idea of children who haven’t lived a life yet, having that second chance and that is what it is like, a second chance. (Woman, Group 2)

I think that if you are in a position [that] these people were in where they knew there was absolutely no hope, . . . I would have done exactly the same. Giving life to other people. (Woman, Group 4)
I think in the final phases we are all saying that we feel it is an altruistic act and it is to a greater
good at our death. (Woman, Group 2)

I am also in favour [of organ donation] because it is a service to humanity and it is giving life . . .
because you are, of course, dying so it is better off that you save someone else’s life, like a gift
for society. (Man, Group 1)

When discussed in this manner, organ donation is situated in the non-medical world.
The role of the donor is perceived to be a valued and integral part of the donation
process. This is shown in references that suggest that the donor’s family has made a
sacrifice in donating their loved one’s organs, and that through organ donation, the
donor will live on, giving meaning to what would otherwise have been a senseless death.

We lost a godson in March this year. Twelve months prior somebody went to the primary school
. . . and talked about organ donors and he came home to his Mother and said . . . It sounds like a
pretty good idea Mum, if anything happens to me you can do that to me. I would like to live on
in somebody else. Now he is saving about eight lives. (Woman, Group 1)

You often hear people say, well my child, my brother gave something to another person, so
therefore they live on. (Man Group 4)

The pro-donation stance was nearly always qualified
In most instances, however, the articulation of this initial pro-donation stance was either
coupled with or followed by a qualifier or a concern, giving, in effect, discourse that
could be categorized into that which expresses the pro-donation stance, and that which
qualifies a pro-donation stance.3 Although articulated within a pro-donation stance,
these qualifiers or concerns suggested an antithetical understanding of organ donation
and transplantation, pertaining to issues of brain death, trade in human organs,
disfigurement of the body after donation, fragmentation of the body at burial, and concerns about
the role of the medical profession in the donation process. What distinguished these
from the former discourse was that they seemed to be underpinned by a mechanistic,
medical understanding of the body as a composite of parts (Nascimento-Schulze, Garcia,
& Arrunda, 1995), and a conceptualization of donation and transplantation as the
mechanistic ‘removal and replacement of body parts’. This is shown, for example, in
references that express concern at how the organs will be removed from the body, and
references that suggest that the recipient is ‘waiting’ for a person to die.

Thinking of them as a hunk of meat, like a piece of sheep or something. That is how doctors
think. (Man, Group 2)

To see this person who maybe looks peaceful if they are brain dead and they must look quite
peaceful and reasonable like they are asleep, they . . . [look alive], and the idea that someone is
going to cut out their heart and their eyes, or these things. (Woman, Group 2)

All these people who might have bad hearts or whatever may be sitting in the hospital praying
God why can’t somebody crash into a tree and a nice 17 year old would do me fine. (Woman,
Group 2)

But there is also someone there waiting for someone to die so they can have their part to save
their life. (Woman, Group 2)

3Obviously not all the discourse from the groups falls neatly into these two categories. What we have done is to focus on
the discourse that can be identified in relation to organ donation and transplantation, acknowledging that other discourse
could be categorized in other ways.
The equation of body organs to parts confers a passive state on the donor and negates their role in the donation process. Within this conceptualization, the donor does not give their organs; instead, the potential recipient waits for the donor to die so they can have the donor's organs, giving a rather macabre, 'Frankenstein' edge to the discussion.

An underlying mistrust in the medical profession's role in organ transplantation also permeated the discourse containing qualifiers or concerns. While some of the mistrust displayed may be attributed to medical practices other than organ transplantation, the idea that the body is the sum of its parts, and that individual parts are able to be removed and replaced lends itself to the notion that these parts, as in any machine, can be bought or sold, especially in the current climate where the demand for organs far outweighs supply. This mistrust could be seen in the discourse in a number of ways. For example, the medical profession was referred to as 'they', which had connotations in the discussions of being not one of us, outsiders, the enemy. There was an implicit connotation that one had to be on one's guard against the medical profession because their hidden agenda was always the acquisition of organs.

The thing is that they can decide when you are dead. (Woman, Group 1)

Yes, doctors are too pushy and want to use us straight away ... All they want to do is get the body. (Woman, Group 1)

If you've got a pushy [one] you might be worried about, you know, worried about his motives. (Man, Group 1)

This gave voice to the possibility that organs could be bought and sold, and that those involved in organ transplantation were not considered to be above monetary temptation, implicating the criteria used by the medical profession to determine brain death. A 'potential donor' might be allowed to die prematurely so that organs could be made available, at a cost, to someone else.

The medical profession ... have to get their act together so that they remove this feeling, or this nagging doubt, out of the common masses that if they donate their organs out of compassion or out of any other reason, they would not be put to an unnecessary or bad use ... and the most deserved candidate would be passed over because somebody else can offer more money. (Man, Group 2)

Well he could let you die because he wants your heart for the next problem. (Woman, Group 2)

Some people sell their parts. In America they sell parts, it is a business. And like I say people have more than one component in them because they can afford it and because the other part is not efficient. (Man, Group 2)

Mutilation, disfigurement of the donor after donation, and the fear that the donor would be fragmented, buried with a 'bit missing', can also be related to the donor being seen as a passive entity, and the conceptualization of the body as a composite of parts. Within this context, organs were perceived as being taken from the donor by the medical profession. They are removed, cut, and pulled out. The donor was not perceived as an integral part of the donation process; they simply provided a 'part' for someone else.

Families want to remember their deceased, their loved ones as they last saw them, rather than getting a mental picture in your mind [that] they have cut a piece out here and they have cut a piece out there, they have taken that piece. (Man, Group 4)

The loved ones who have to make the decision [have] the thought that they are not burying the person they have loved all their life because there is something missing. (Man, Group 3)
We associate a person as being whole, not fragmented and in bits (reference to how the person is seen after organ donation has occurred and in relation to the need to bury that person).
(Woman, Group 1)

The pro-donation and qualified stances are dovetailed within one representational field
The discourse from the focus groups suggests that organ donation and transplantation were being interpreted within two distinct, but intertwined, frameworks of meaning. First, organ donation and transplantation are articulated within a pro-donation stance that unreservedly endorses the practice, and meritoriously interprets it within the benefits it offers to society. This is iconized, objectified as a ‘gift of life’. Second, organ donation and transplantation, still interpreted within the pro-donation stance, are qualified to reflect practices that are of concern to the individual. Within this pro-donation stance, organ donation and transplantation have a mechanistic iconic image of ‘the removal and replacement of body parts’. This suggests that while there are two distinct, and possibly dialectically opposed, interpretations of organ donation and transplantation, they do not relate exclusively to either donation or transplantation. Rather, they appear to dovetail to form one representational field that includes both organ donation and organ transplantation. This coexistence is suggested by three factors. First, all members of the groups were familiar with these two ways of interpreting organ donation and transplantation, and were able to communicate the ideas associated with both interpretations. This is not to say that they agree personally with one or the other, but rather that they could easily engage in discourse involving one or the other. This brings in the notion of consensual reality, as opposed to consensus per se. Consensual reality refers to tacit shared knowledge, common ground that does not result from holding the same views but rather from the fact that, even in disagreement, social subjects still know what they are talking about (see Rose, Efraim, Joffe, Jovchelovitch, & Morant, 1995, p. 152 for a full discussion of this distinction). Second, individual members often discussed organ donation and transplantation using both interpretations. Third, when discussing some issues (for example, the reciprocal nature of donation), a member would switch between these two interpretations, often acknowledging that they were doing so.

While the existence of a composite or ‘hybrid’ (Gervais & Jovchelovitch, 1998) representational field containing dialectically opposed images may be at odds with the notion of a representation having a united, cohesive, coherent character, a historical review on the development of this representational field suggests that it is quite plausible (Moloney & Walker, 2000). The representation has evolved over time, and in so doing encompasses beliefs about organ donation and transplantation that are not ‘objectively’ cohesive, but nevertheless coexist. Organ donation can be understood as a ‘gift of life’ from one human being to another, a noble and altruistic act that benefits society. However, it can also be understood within a framework that is bio-medical in origin. Concerned more with life than death, it pacifies the donor and relegates their role in the donation process to that of a spare part, suggesting that brain death may not be bona fide, that mutilation could be an end result of the donation process, and that organs could be bought and sold.

The representational field of organ donation and transplantation, and the normative and functional dimensions of the core
Guimelli (1998) suggests that the core of a representation may be hierarchically arranged into normative and functional dimensions that are differentially activated
depending on the context in which the representation is elicited. Our findings are compatible with this, and suggest that there are two conflicting frameworks—the ‘gift of life’ and the ‘removal and replacement of body parts’—through which information about donation and transplantation is interpreted. This contradicts the idea of a representation having a united, cohesive character (see Abric, 1993). Instead, it suggests a representational field that is characterized by “incoherence, tension and ambivalence”, but through which presides a “consensual reality” (Rose et al., 1995, p. 152). This was demonstrated in our research by the fact that, although different individuals raised differing concerns about donation and transplantation, often oscillating between support and negation for the idea, all of the participants were familiar with the arguments, qualifiers and concerns that were raised. There was consensual reality, not consensus per se.

We suggest that the ‘gift of life’ framework reflects the normative dimension of the core, creating a pro-donation stance in which donation is seen as noble, worthwhile, and altruistic. Support is found for this in research that persistently documents that the majority of Australians support the idea of organ donation (Dye, 1995; Frank Small & Associates, 1995; Kidney Foundation, 1995) and by anthropological studies that suggest there is a societal norm of gift-giving that is inclusive of the obligation to give, to receive and to repay (Mauss, 1954, cited in Gibson, 1996). Virtually all of the members of the four groups stated that they believed organ donation to be a good thing, a worthwhile altruistic act that benefited others. However, the qualifiers were not separate from this. Articulated within this pro-donation stance, it appears that the two understandings operate together, despite their apparent contradiction. The qualifiers were possibly expressing the functional dimension of the core, interpreting organ donation and transplantation in relation to the individual person, and clustering around this image of the ‘removal and replacement of body parts’. Concerning the individual, they are nevertheless commonly shared—the fear of brain death, concerns over disfigurement after donation, mistrust in the medical profession and so on.

While these two understandings may ‘objectively’ be in conflict with each other, it may be their differential role in the representational field that facilitates their coexistence within the representation. Members of the focus groups quite comfortably utilized both understandings, often acknowledging that they were doing so, which suggests that the solicitation of the understandings could be linked to context. Abric and Tafini (1995, cited in Guimelli, 1998) demonstrated that when subjects had no practical experience of the social object, there was a much higher activation of the normative dimension of the core leading to a representation that was highly saturated with norms and judgments or ideological positions. However, when subjects had a direct relation with the social object, it was the functional dimension of the core that was characterized by a high level of activation. This is aptly illustrated by the following quote:

**Context:** Discussion was around concern over human trade in organs and the possibility that this may happen in Australia

I don’t think it would happen now but for people who are faced with the problem in Australia now, I think the reason they say no at the moment is the fact that they don’t want to see or the thought of their loved ones being chopped up when they are already dead. But I think if you are looking at when you have ticked it on your form [driving licence] you might not die for 30, 40, or 50 years, what the situation would be then. (Woman, Group 2)
Drawing from this, it would seem that when the direction of the focus group discussions called upon members to discuss organ donation in an ideological fashion, or in a way that allowed them to distance themselves personally from the perceived reality of the ‘actual practice’ of donation, the normative dimension of the core was activated. Conversely, when the trend of the discussion called for the members to relate the practice of organ donation to themselves or to their individual beliefs, the functional dimension was activated. This is not an either/or situation. The elicitation of the dimensions of the core must also be inclusive of how each individual perceived the context of the discourse. Moreover, the contextualization of the discussions within the normative stance may reflect the findings that the normative dimension plays a more fundamental role in the internal functioning of the representation (see Guimelli, 1998) and/or the fact that this was only a discussion about organ donation and transplantation, and, ultimately, members were able to walk away from the discussion without having to partake in a ‘real-life’ donation situation. What we do suggest, however, is that the representational field pertaining to organ donation and transplantation has dialectically opposed understandings that are differentially organized into normative and functional dimensions that are, to some extent and in some way, activated by the perceived contextualization of the discourse.

**Dynamism, debate and the transformation of the representation of organ donation and transplantation**

Our original theoretical position drew from the theory of the central core, and the more recent extensions of this presented by Guimelli (1998). Although the differential activation of the normative and functional dimensions of the core does provide a plausible mechanism as to how dialectically opposed core elements within a representational field can coexist, the structuralist approach does not address the role of opposition in the dynamism of social thinking.

One of the characteristics of our data was the contradiction that permeated the discourse—between the pro-donation stance and the qualified pro-donation stance, and within the latter. Hence, *post hoc*, we turned to discursive psychology, in particular the rhetorical position advocated by Billig that views argumentation and conflict as central to social thinking (Billig, 1987, 1988, 1991a,b, 1993).

There is debate as to whether social representations (SR) theory can, or even should, be allied with discursive psychology (see Augustinos & Walker, 1995; Potter & Edwards, 1999; Potter & Wetherell, 1987). However, both Billig and Moscovici acknowledge compatibility between the two theories.

Concerning discourse analysis, it is perfectly compatible with the theory of social representations. In fact, discourse analysis started next door to my laboratory with the work of Pecheux and Henry. It was applied to the study of social representations by Pecheux himself . . . It is true, though, that I do not subscribe to the formula ‘language uberalles’ (Moscovici & Markova, 1998, p. 405).

This leads directly to the rhetorical view, which stresses the importance of argumentation and negation. The rhetorical perspective . . . can complement that of the social representation theorists, regardless of whether the universal or particular concept of social representation is adapted (Billig, 1991a, p. 59).

While it is not our intention here to provide a comprehensive account of the epistemological differences between social representations theory and discourse analysis, we do acknowledge that there are differences. Broadly speaking, discourse analysis
is concerned with analysing the socially constructive nature of language (Augoustinos & Walker, 1995; Potter & Wetherell, 1987). Language is functional. Words are used to achieve things; they do not merely state or describe. Within discursive psychology, language is contextual and reflexive, constructing the nature of objects and events as they are discussed. Discursive psychology, however, does not assume beyond the text, it does not use discourse to identify phenomena or entities underlying the text. Representations are constructed in talk and texts. Therefore, analyses focus on the ways in which representations are constructed, and their function in rhetorical action (Potter & Edwards, 1999). In contrast, social representations theory argues that the same patterns of discourse are indicative of social representations underlying the text.

While certain forms of ordinary explanations or particular linguistic repertoires or rhetorical devices all describe identifiable features of social discourse, these are also all features of discourses of particular groups about specific aspects of social life, and thus drawn on underlying social representations (Duveen & Lloyd, p. 5).

A pervasive theme in much discursive psychology is the variability of people’s talk. What people say depends on the particular context in which it is spoken and the function it serves. The context of talk changes and so does its function. As people are engaged in conversation with others, they construct and negotiate reality (Augoustinos & Walker, 1995; Potter & Wetherell, 1987). It is from this position that discursive psychology levels another of its criticisms at SR theory, finding fault with its static conceptualization of consensuality and its use of methodological procedures that obscure this natural variability in discourse. We agree with this criticism, and find evidence to confirm this natural variability in our discourse. It was, as we have said, the central finding from our analyses. And, while we acknowledge that other criticisms have been made towards SR theory, such as its tendency to cognitivism through its concepts of objectification and anchoring, and its methodologies, its failure to characterize action within the theory, the problematic distinction between common-sense and scientific knowledge (see Billig & Potter, 1992; Potter & Edwards, 1999, for further elaboration of these points), we focus here on the validity of the criticism concerning variability in discourse.

Potter and Billig (1992) criticize SR theory for treating conflict as something that happens primarily between groups and individuals with different representations, and its failure to acknowledge that a representation may itself be an area of conflict. “At present SR theory does not theorise conflict which occurs between people or groups who agree in representations—for example it does not address the idea that representations can provide an arena for dispute” (Potter & Billig, 1992). However, we argue that Rose et al.’s (1995) conceptualization does, and discuss Billig’s rhetorical position of argumentation and debate within this context:

A representational field that allows “contradiction, fragmentation, negotiation and debate” and which is characterized by “incoherence, tension and ambivalence” but through which presides a consensual reality (Rose et al., 1995, p. 4).

The rhetorical position advocated by Billig (1987, 1988) has commonalities with SR theory in that both stress the socially constructive nature of thinking. However, Billig maintains that Moscovici’s central notion of the ‘thinking society’ must be replaced by the notion of an ‘arguing society’, so that the voices of dispute and controversy are heard in the endless babble (Billig, 1988). It is the contrary themes in social representations that provide the content for discussion and, hence, social thought.
Consensuality, then, is problematic to Billig, because it obscures the very mechanism integral to social thought—argumentation. When people think, they are either explicitly or implicitly arguing with themselves or with others. This argumentation creates dilemmas of choice that are crucial in the production of thought, as without them, there would simply be nothing to deliberate over (Billig, 1988). When people talk about social issues, they often draw on phrases, maxims and clichés that are commonly shared within a community, and this commonly shared knowledge contains contrary themes. This does not imply argumentation between social groups subscribing to a particular view of the world, nor is society being divided into those who will argue for one particular position and those who will argue against. Rather, it is because of the dilemmatic nature, not the consensuality, of social issues that people will oscillate between these positions or, when faced with an emphasis on one position will seek to balance that position with its counter-value. This is “thinking in practice” (Billig, 1997, p. 45). We illustrate this in relation to the discourse from our focus groups by presenting exemplars of discourse centred around the concept of death.

The nature of death

Death, in a generic sense, permeated all of the discussions. Yet the meaning of death was not static. We do not imply here that death as in ‘brain death’ or ‘fear of death’ was the primary concern associated with donation and transplantation. Rather ‘death’ was pervasive in that understandings about death were linked to the context of the discussions, creating contradiction and tension in the discourse, but through which presided a consensual reality that allowed communication, and hence agreement and disagreement, to occur.

Medically, the donation of the major organs occurs when the donor is certified by two independent doctors as brain dead. Despite what appeared at face value to be an acceptance of the medical definition of brain death, and an understanding of the role that life support played in the process of organ donation, the notion of brain death created a dilemma because the organs were removed while the heart was still beating. This was interlaced with other more ‘traditional’ understandings of death. For example, for some members, a physical sign of life (such as a beating heart or breathing) was what defined life from death and, hence, confounded the actual moment of death, the finality of death, and the relationship of death to burial. Below is a sequence of such debate.

Context: Previous discussion had centred on religion and death

The heart is still working, the lungs are still working and they wheel you off to the theatre and they cut you open while you are still breathing. The heart is fit. The removal of the beating heart. (Woman 1, Group 1)

Does that happen does it? (Woman 2)

That is when they give the definition of brain death. The heart is still pumping. I can’t be happy with saying that person is brain dead when they are still breathing. (Woman 1)

I agree. (Woman 3)

And the idea of somebody being dead is they are ready to be buried. Would you bury someone who is still breathing and his heart is still pumping. I just can’t accept brain death. (Woman 1)
I understand what you are saying. But the difficulty I have with that from a medical point of view is that you can’t actually wait until the person has stopped breathing and therefore the body is de-oxygenated, the organs aren’t useful at all. For instance if the heart is only beating because they’re on artificial maintenance that’s keeping them alive, but if they are taken off their life support system their heart wouldn’t be beating and they wouldn’t be oxygenated. (Man 1)

Some people do continue to live for some time when they are taken off life support, so you can’t be sure that is the case. (Woman 3)

It’s like pulling someone’s life away from them before they are ready to leave. Before the soul is ready to depart from that body, leave it in peace. Someone I presume is coming in to disturb its natural occurrence. (Woman 4)

But if you’re keeping it artificially alive on a life support system, how different is that. Oh no, I don’t believe in artificial life support systems. (Woman 3)

Yes, I think I could go along with that because once you are gone, I think the time’s up so they could come along. (Man 2)

All participants had a common knowledge about brain death but did not necessarily all agree on points of that knowledge. Yet through the process of debate, and even just simply stating their point on this knowledge, there was consensus about the problems with recognizing death in the form of brain death. In this sense, death also appeared to be contextualized in relation to the self (by this we include the individual, family and close others), and within the context of the removal of organs for transplantation to some other, as these following two quotes illustrate:

If they can assure us that we are not going to wake up. (Man, Group 1)

I think that is one of the times it is difficult, they say he is clinically dead but we will keep him alive for 24 hours so that we can donate his organs, what does he suffer? (Man, Group 3)

The finality of death was also an issue. Interestingly enough, it was used both to bolster and to qualify the idea of organ donation. This could be seen in the use of expressions such as “once you’re dead, you’re dead”, “when you’re gone, you’re gone”, “when you’re gone, that’s it”. These expressions gave an opening simultaneously both to confirm and contradict the absoluteness of death, supporting both the notion that “since you’re dead, why not donate your organs”, and the counter-position that “brain death may not be definitive so if you do donate your organs you’ve given away your (or someone else’s) last chance at life”.

A conflict also occurred between the finality of death and the need for the body to be intact for burial. One aspect suggested that if death is absolute then the ‘fragmentation’ of the body for burial is not an issue. This was counter-posed with the notion that nobody really knows the absoluteness of death, therefore you may need your body to be intact at burial in case there is an after-life.

The use of brain death as the ‘defining moment of death’ was also contextualized within the traditional associations of death and burial. This created a further dilemma because members felt there was not enough time to say goodbye properly. With the more traditional definition of death, that is inclusive of a burial with the body intact, members felt that they had time between the notification of death and the burial to say goodbye. This suggests that death in this context is understood as a process; there is no one particular ‘defining moment of death’. This conflicts with the medical, legal, and ethical requirement in the transplantation process for a single ‘defining moment’.
A young man was killed in an accident of some sort and one of the doctors was practically jumping on him to get the organ parts out . . . I think this is probably a great issue for a lot of people, it has to happen so quickly. (Woman 1, Group 1)

There isn’t enough time to accept that somebody they love very much has just died and then they have to make a decision based on the reality when the truth is often it takes weeks or months for someone to accept that person has died. (Woman 3, Group 1)

**Debate, consensus and social representations**

Debate within consensus characterized much of the focus group discourse, but in differing ways that reflected the nature of the issue. For example, issues such as *Brain death*, *Scepticism of the medical profession*, and *Trade in human organs* created argumentation in that there were difficulties reconciling differing aspects of the issue, yet there was consensual reality in that the argumentation and debate occurred within a common body of knowledge. Discussion of issues such as *Next of kin’s right in the donation process* was characterized by a consensus of concern (e.g. there was collective moral indignation that the donor’s own personal wishes could be overridden by the next of kin) but was also permeated with discord over the nature of brain death and, in some cases, scepticism towards the medical profession. Both of these were integral in how this issue was being understood.

The discourse was also characterized by a referencing of the concern or the issue to the self (the individual, family, or close others), or by intellectualizing the issue by treating it in a distant manner. When the issue or concern was referenced to the self, the self frequently served as a reference for the donor, and donation and transplantation were conceptualized within a ‘mechanistic’ medicalized framework. The organs were ‘removed’, ‘cut out’, ‘taken from the body’, and referred to as ‘parts’ or ‘bits’. These references were also permeated with varying concerns about death and the medical profession. It was within this context that much of the argumentation and debate occurred. Conversely, when donation and transplantation were discussed in a distant manner, it was frequently within a positive ‘gift of life’ framework. Organ donation was the ‘individual’s choice’, a ‘gift to society’ or ‘humanity’, ‘an altruistic act’ that was noble and worthwhile. There was no debate over this, no argumentation. This was taken as a given, a highly normative response.

There are three points that can be drawn from this. First, the conceptualization of organ donation and transplantation is not static. Understanding about this issue was very much linked to the context in which it was discussed. Second, the conceptualization contains a dialectical opposition. Discourse was frequently polarized between a ‘gift of life’ framework and a framework organized around the mechanistic image of the ‘removal and replacement of body parts’. Although these frameworks appear as dialectical in opposition, the participants were comfortable with this contradiction. It is often assumed in social psychology that oppositional views create discomfort and tension in the individual. Here, though, the frameworks were dialectically opposed to each in character, but the participants appeared entirely comfortable with that opposition. Third, the contradiction that characterized the debate created the dynamics that, we believe, mirror the processes of change in a social representation in the wider community.

Through the process of debate, members were able to articulate and discuss the conflicting nature of the donation dilemma and, in so doing, either reached a position that was slightly different from that held at the beginning of the discussion, or consolidated how they felt. Whether this pertains purely to the moment (i.e. in the focus
group discussions) or is more lasting, we obviously do not know. This is worth further investigation, especially in relation to the chronic shortage of donors. Social representations are fluid, not static. We have found that the processes of debate create contexts that elicit different aspects of a representation field, engaging individuals in debate, argumentation and negation about the social object.

Social understandings about issues such as donation and transplantation are continually being constructed and negotiated, engendering the transformation of social representations. We believe that this reflects the wider processes in society that continually create, modify and change existing social representations. We propose an interdependence between, on the one hand, a representational field, conceptualized as contradictory and centred around conflicting core images that have developed over time and reflect the differential normative and functional dimensions of the core, and, on the other hand, the dynamics that give rise to the contradiction and argumentation inherent in discourse. Both are highly context-specific, reflecting the local context and function of the discussions, the social and historical epoch, and the social life of which the discourse is a part.

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References


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