# The Structure of Intentions

MARGARET A. BODEN

## I

What are intentions? What, for instance, is the intention to buy a loaf of bread? Theoretical psychologists offer differing answers to these questions, for they disagree about the nature and importance of intentions. Not all allow that intention is a useful systematic concept, and even those who do so define it in significantly different ways. My central thesis is that any specific instance of intention is a highly structured phenomenon arising within a highly structured system, and that the nature of intention as a psychological reality cannot be understood unless this fact is taken into account. Generic characterizations of intentions in terms simply of their immediate goal or purpose—as in expressions of the form 'the intention to *X*'—denote general types of phenomena whose individual tokens may differ greatly. In a sense, then, there is no such thing as *the* intention to buy bread, since intentions to buy bread comprise a markedly heterogeneous class when considered in light of their psychological structure. These differences are important because they determine the function of particular intentions within the life of the agents in whom they arise, and they can be expressed only by a theory of intention adequate to represent the distinct structures that may be concerned. Such a theory would readily allow that the psychological nature of intentions to buy bread, for instance, may be very varied indeed.

## II

All identifications of intention mention a particular end or purpose, in terms of which the intention is characterized. Thus the variable *X*, in expressions of the form 'the intention to *X*', specifies the goal that the agent intends to achieve. It follows that any satisfactory definition of intention must stress the goal, where this is conceived of as an idea which is the in-

*J. Theory Soc. Behaviour* 3, 1. *Printed in Great Britain*

tensional object of the intention, rather than as an existent state-of-affairs in the real world. Indeed, intentions might be defined purely in terms of their goals, in terms of what the agent intends to achieve. It would follow that all persons intending the same goal, or end-state, could be said to share the same intention. Any psychological difference there might be between these people would then be differences in the psychological conditions surrounding or attendant upon their intentions, not differences intrinsic to the intentions themselves. If a number of people all have the goal of buying bread then, according to this definition, each has the same intention, no matter what else may distinguish them. All instances of intention satisfy this 'minimal' definition. But most intentions satisfy a rather stronger characterization—one which suggests structural distinctions between superficially equivalent intentions that are hidden by the minimal definition, and which stresses the active role of intentions in guiding behaviour towards their goals.

It is crucial to appreciate that a goal (or purpose) is a type of idea which is potentially directive, which can somehow influence and guide the agent's actions. It is not a mere picture, a mere representation of some hypothetical state. References to intention in everyday life—and in those psychological theories which admit it as a systematic term—are regarded as explanatory of action because the intention is conceived of as somehow bringing about, causing, or directing the action intended. The intention to buy bread, for instance, somehow results in the act of purchasing a loaf. This functional feature of intention is emphasized if one thinks of an intention as a schema controlling the procedures to be executed in behaviour, as a plan of action that can be realized in actual operations carried out by the agent. The essential aspect of any given intention is thus some procedural schema or action-plan. For the time being I shall use these two expressions interchangeably, even though they have significantly different overtones. The crucial question at this stage is to ask what must be the nature of an action-plan, in order that it may be able to carry out the controlling function commonly ascribed to intentions.

An action-plan is an internal representation of possible action that functions as a model guiding intentional behaviour.[1] It is closely analogous to the sets of instructions comprising procedural routines within a computer program, for such routines also specify certain operations and control the order of their execution. Indeed, one of the more fruitful definitions of 'intention' to be found in contemporary psychological theory

[1] The sense in which I use the term 'model' is discussed at length in Boden [1972].

explicitly draws such a comparison: this is the definition given by Miller, Galanter and Pribram, to which I shall return later in the paper.

The goal or putative end-state of an intention must be represented within its action-plan. This representation may be of varying levels of generality: one may intend to buy a fresh, one-pound, wholemeal loaf or one may intend to buy the first loaf one sees, irrespective of type. If the intention to buy bread is functioning as part of a further intention, then certain representations of the goal of buying bread may be more appropriate than others. For instance, any loaf will do to feed the ducks, but if one aims to make cucumber sandwiches for Lady Bracknell then certain constraints on the nature of the loaf must be satisfied. These constraints form part of the goal-representation within the action-plan. The goal may be of various logical types, including a bodily action, a social act, and a state of affairs towards which one can strive but which is not itself an activity of any kind.

It is by reference to the goal that other features are brought into the action-plan for, given the goal to be achieved, the generation of an appropriate action-plan for achieving it is a form of conscious or unconscious problem-solving closely guided by the agent's preferences and beliefs. Sometimes an appropriate action-plan is already available and needs only to be located and activated. But sometimes an action-plan has to be generated afresh, becoming articulated in more and more detail as time passes. A complete action-plan will include representations of the procedures or means-activities selected for pursuing the goal. The plan may also involve beliefs about the likely consequences of different means-activities, considered at the general level of strategy and at the detailed level of tactics. A number of alternative procedural structures may be specifically represented at a relatively early stage in the development of the intention. Such 'contingency planning' aims to anticipate difficulties and obstacles which may arise when the intention is carried out. Very often, tactical decisions are not made (or even considered) until the intention is actually being executed, although strategic decisions may have been articulated long before the intention is put into effect. Procedural schemata are generated recursively, in that a high-level action-plan is compounded of a series of low-level plans, each of which is itself a hierarchical structure generated from more basic action-plans. Thus a plan for the act of buying a loaf may include sub-plans for walking to the bakehouse, opening the door, greeting the baker, taking the bread, and handing over the money. This series is temporally ordered, at least in part: although one might hand over the money before taking the bread, one could hardly do either

before reaching the bakery. In turn, 'handing over the money' involves delving in one's pockets or handbag, picking out certain coins, and transferring them to the baker's grasp. The intention to buy bread may then be said hierarchically to include all these action-plans (all these intentions), although this is not to say that each one must be represented at some fully conscious level of the mind at the initial (or any) stage of intentional activity.

Of course, not all intentions are feasible: even a highly detailed action-plan may involve internal inconsistencies, or faulty assumptions about the agent's capabilities and/or the nature of his environment, which vitiate the possibility of actually effecting the plan. In general, it is more difficult to be sure that an intention is feasible if its action-plan is formulated only at the strategic rather than the tactical level. Translation from strategy into tactics may reveal unsuspected snags requiring a complete revision or recasting of the action-plan, or it may show hidden procedural gaps between subordinate units which have somehow to be filled before the action-plan is complete. It is especially difficult to be confident of the feasibility of an intention that has been formulated only in the minimal sense, with no attempt at articulating an action-plan. In such cases, some state-of-affairs is accepted by the agent as a goal without even the sketchiest procedural plan. The minimal definition of intention (in terms of the goal-state alone) covers such cases, whereas the characterization in terms of action-plans apparently does not. But even here one must at least allow that the goal can be put on a list of 'things to be done', which implies that the agent considers it as potentially directive, or purposive, as something which could be expanded into an action-plan. Analogous processes might occur within the running of a computer program, where some task is listed as something to be done later, although no plans are currently formulated for so doing. It may turn out, of course, that no effective action-plan can be formulated—either because of specific limitations set by the agent's mental structure or because the task is in principle impossible (like 'squaring the circle').

If the agent is to achieve success in his intentional behaviour, many of his beliefs about means-end relations must qualify as strategic or tactical knowledge about the procedures appropriate for achieving his purposes in his world. Intentions are likely to be effective only if the inner organization or structure of action-plans adequately represents the opportunities for and constraints upon action in the agent's physical and cultural environment.

A person's effective intentions draw upon some highly abstract and

general schemata or belief-systems, such as those representing the generative rules of linguistic grammar, the potentialities for bodily action in three-dimensional space, and the overall psychological nature of human interpersonal relations. Intentions also involve a host of more particularized schemata representing the structure of the agent's world, of which an important class are those providing psychological information about culture-specific conventions and social roles and about the idiosyncracies of individuals within the agent's personal acquaintance. These include, for instance, representations of particular religious rituals connected with sacred bread (of which one example would be the Christian sacrament of the Eucharist), representations of the conventional rules prescribing the acts of barter or monetary exchange within particular societies, and representations of Lady Bracknell's attitude to cucumber sandwiches. The information represented by these schemata specifies constraints upon the possible action-plans appropriate to many different classes of intentions, including 'the' intention to purchase bread.

As well as schemata representing constraints on and opportunities for planning actions, the agent must also have available more or less independent representations of methods or strategies that may be called upon in forming action-plans. Some of these are very general, such as 'when in difficulty, try the procedure which worked in some previous, similar, case'; others are more specific, such as 'when you need a small amount of money and have no change, try to borrow it from a friend'.

In so far as these varied types of schemata may be thought of as information stores, available to but independent of particular intentions, they may be labelled 'cognitive' rather than 'conative'. But they contribute to the inner structure of every intention, for they function so as to provide sets of rules for selecting and combining action-plans. If one intends to buy bread, for instance, the knowledge of which bakers are open and which are shut on that day of the week will enter into the generation of one's plan of action in a definite way; one's knowledge of local topography (and perhaps of map-reading) will guide one's locomotion to the selected shop; one's knowledge of linguistic grammar and of the reciprocal roles of shopkeeper and customer will both be needed to generate that part of the action-plan concerned with speaking to the baker; and one's financial competence will guide and monitor the exchange of coins over the shop counter. Not all these forms of knowledge will be consciously expressed, or even expressible, by the agent who structures his intentional behaviour by way of them. Crucial aspects of intentions may thus be hidden to introspection. But unless an intention is thought of as an action-plan that can draw upon

background knowledge and utilize it in the guidance of behaviour one cannot understand how intentions function in real life.

Since intentions involve action-plans organized in light of the cognitive structures within the mind, it follows that the inner structure of 'the' intention to *X* may vary considerably in different individuals and societies. In Penge one could buy a loaf of bread by telephoning the baker before his delivery van leaves and promising to mail a cheque in the nearest pillar-box; presumably, in Patagonia one could not. And even in Penge one could walk to the shop and pay cash oneself. If Marie Antoinette really said 'Let them eat cake', she must indeed have lived worlds apart from starving peasants wishing—but unable—to buy bread.[1] In view of the great variability of human circumstances, preferences, social customs, and beliefs, the potential for structural variation between distinct instances of 'one and the same' intention is very rich. In the minimal sense, of course, two people with the same purpose in mind have the same intention. But their subjective views of the world may be so different that the ways in which their respective intentions function are extremely diverse. If the intention to relieve someone suffering convulsions arises within the cognitive context of tribal witchcraft, it will be different in many ways from its analogue in the context of Western medicine; thus the latter, though not the former, might involve purchase of a loaf of rye-bread as a means to biochemical confirmation of the diagnosis of ergot poisoning. Only a structural theory of intention could recognize and adequately account for this diversity. References to intentions which identify them merely in terms of the intended goal, as in expressions of the form 'the intention to *X*', provide only a minimal characterization of the psychological realities involved.

## III

Not all intentions having the same goal and action-plan are psychologically equivalent—not even if they are subordinate to identical further intentions. For intentions also serve deeper (as opposed to further) purposes. Any psychology which recognizes intentions or purposes at all must allow for the myriad 'superficial' purposes of men to be explained in terms of underlying

[1] The distinction between a wish and an intention is that a wish does not even have the illusion of a feasible action-plan—nor any expectation on the part of the agent that he may be able to generate or effect such a plan later.

purposes of a more basic and enduring nature.[1] Unless a putative goal can be somehow linked with one or more of these deeper purposes, it cannot be accepted as an intention by the mind in which it is represented. This linkage may be complex and indirect, so that apparently similar intentions can differ significantly in their deep conative structure. In other words, they may vary in their dynamic or motivational base and in the way in which they are linked with the base. Psychodynamic theories or depth-psychologies (*sic*) attempt to show how this linkage is effected. They postulate a relatively small number of basic conative elements (named 'motives', 'instincts', 'tendencies', 'needs', and 'drives') and a set of theoretical rules for establishing connections of various sorts between these elements and putative goals of a more sophisticated or superficial nature. On the assumption that the intention of buying bread can be correctly ascribed to each of six men waiting in line outside a bakehouse, and that the action-plans for achieving their respective purchases are identical, one may ask how depth-psychology might distinguish between the individual intentions concerned. This is to ask how the nature of each individual intention depends upon its structured relations with the system of deeper goals within which it has arisen and by which it has been accepted.

The psychodynamics of this example may at first sight appear so obvious as to be trivial. It seems safe to assume that any psychologist who commits himself to compiling a list of 'basic', 'instinctive', or 'natural' goals will include the goal of food-gathering (the elemental motive of hunger), unless he is theoretically so parsimonious as to ascribe all purposive action to the hedonistic pursuit of pleasure. Barring theoretical hedonists, then, one might say that a psychodynamic theory must ascribe the intention to buy bread directly to the motive of hunger. And, indeed, the first man in line may be licking his lips and rubbing his stomach, and may eat the loaf as soon as he gets it—clearly achieving a consummation devoutly to be wished. Here there is little purposive depth and minimal motivational structure: the theoretical path linking the basic goal of food-seeking to the intention of buying bread is short and uncomplicated.

However, the second man may carry his bread round the corner with a lascivious smirk, depositing it in the lap of a starving and beautiful girl. Even if he shares her repast, one would be innocent indeed to assume that he must be motivated purely (if at all) by hunger. The fact that he may be driven both by sex and by hunger is a simple example of what Freud called the 'overdetermination' of behaviour, the possibility that two

[1] This point is taken for granted in the present paper, but argued in Boden [1972], pp. 43–5, 158–89.

dynamic structures may generate one surface intention at a particular moment in time. Because the intention to *X* can thus have two or more 'meanings' simultaneously, it is possible for a purposive action to 'kill two birds with one stone'. Since either theoretical interpretation suffices to generate the surface intention, the other interpretation may always be rejected without thereby leaving the intention wholly unexplained in dynamic terms. This accounts for the ease with which critics of Freud can dispense with his interpretations of the unconscious symbolic meaning or 'psychopathology' of everyday intentions—to collect stamps, for instance, or to smoke a cigar—without necessarily thereby creating an explanatory vacuum.[1] Cases of overdetermination aside, it is clear that a man *may* be motivated by sexual desire alone when purchasing bread, in which case his intention to buy bread is basically different psychologically from that of a hungry person. The dynamic structure is still fairly simple, for only one uncomplicated basic conative category needs to be mentioned—namely, sex. However, the surface intention is not immediately generated from the sexual base, but has to be mediated by the man's psychological knowledge of the nature of gratitude: how it can arise and how it can affect the actions of the grateful person. This knowledge of interpersonal psychology is not necessary to generate the surface intention of getting bread from the dynamic base of hunger.

It should not be assumed that if a man eats the bread then he must necessarily be motivated by hunger, even in part. The third man in the queue, let us suppose, buys fifty loaves and instals himself in the local exhibition-hall, where he proceeds to munch his way through the pile until nausea supervenes. A simple theoretical generation of such behaviour from hunger alone would hardly be convincing. It is of course possible that he is a destitute cripple whose distress is being exploited by a callous impresario, by an unfeeling showman who has promised him pound for pound, sterling for avoirdupois, in respect of all the bread he can consume within the hour. If so, his intention to buy bread could be generated from his present hunger, together with his expectation of

[1] This assumes that the behaviour in question is allowed by all to be intentional, but that Freud ascribes a further (unconscious) intention which may be doubted by the critic (either agent or observer). Many examples of what Freud called 'the psychopathology of everyday life' are not cases of overdetermination, since they are not normally thought of as intentional at all and apparently have no alternative dynamic explanation (e.g. memory lapses and slips of the tongue). The 'alternative explanation' of fatigue, for example, may show why some slip or other occurred, but cannot show why one slip rather than another was produced; it is this which Freud attempted to explain (Freud [1901]).

future hunger. But if he is a normal man in full employment no such generative structure would be plausible. His intention might, however, be attributed fairly directly to basic motives such as competitiveness or self-display, each of which have been posited as ultimate conative categories by a number of theoretical psychologists.

The last example suggests that identification of the ultimate conative categories may be a controversial matter: not all psychologists would be willing to include competitiveness and self-display in their list of basic motives, or instincts. This does not mean that they would disallow all reference to such items as being irrelevant to the dynamics of intention, but rather that they would regard them as terms on a higher (more complex) theoretical level than their postulated basic categories of desire. Competitiveness and self-display would then be represented as high-level psychological phenomena generated from more basic purposes. This type of theoretical disagreement may be illustrated by supposing that the fourth man outside the bakery takes his loaf to the altar of his church as an offering for the harvest festival. 'Religious' motivation, to be sure—but how is such motivation to be analysed?

Theoretical psychologists differ considerably in their conative analysis of religious behaviour. A few writers—such as Darwin ([1871], ch. iii) and Starbuck ([1899])—have regarded it as directly attributable to a specifically religious instinct comparable to the sex and hunger drives. Darwin even claimed to have detected an animistic instinct in animals, which he assumed to be an evolutionary precursor of the human religious instinct.

Others refuse to derive religious behaviour from a distinctively religious instinct, but none the less explain its motivational base in terms of one instinct almost to the exclusion of others. For instance, Trotter based religion in the social or gregarious instinct, which he called the 'herd-instinct'. He characterized religious feeling as 'a sense of personal incompleteness which compels the individual to reach out towards some larger existence than his own', and regarded it as closely analogous to the physical loneliness and intellectual isolation which, he claimed, are effectually solaced only by the nearness and agreement of the herd ([1916], p. 113).

Freud, in contrast to Trotter, attributed religion primarily to the sexual instinct: though the psychological processes involved in the generation of religion from sex may be very complex, the dynamic base of religion he saw as overwhelmingly sexual in nature ([1913], [1927], [1930]). The complexity of the unconscious ('primary') processes transforming the sexual basis into the surface phenomena of religion allow for structural distinctions between religious intentions. For example, Freud's account of

a priest's quest for bread intended for the Christian sacrament of the Eucharist would mention more complex processes of sublimation than would his explanation of St. Teresa's language of religious ecstasy. The psychological meaning of the Eucharist, according to Freud, involves the Oedipus complex; symbolic representations of identification with another person by way of bodily incorporation (similar to the representations underlying ritual cannibalism and pagan sacrificial totem feasts); and notions of *self*-sacrifice which can support the guilt-appeasing doctrine of the Atonement while at the same time representing the final triumph of the son over the father (Freud [1913], ch. iv, secs. 4–6). Only some of these symbolic transformations need underlie the purchase of bread for a harvest festival, since this may be conceived as a thanksgiving ritual with no sacrificial component. And fewer still would be crucially involved in St. Teresa's mystical experience of personal relationship with her Saviour. In others words, in Freud's theoretical system the generation of the sacramental incorporation of bread requires more symbolic transformations of the sexual basis than does the generation of a nun's love of Christ.[1] In turn, Freud would be able to distinguish between the 'religious' sexuality of St. Teresa's passion and the 'secular' sexuality of a man who enters a church merely for purposes of flirtation—for only the former would involve any of the conative transformations typical of religious sublimation. All truly 'religious' intentions must involve these sublimational processes in some degree.

Still other psychologists represent the dynamic basis of religion as a complex of motives. McDougall, like Trotter and Freud, regarded religious intent as springing from basic purposes of a secular nature; but he analysed religious motivation as a hierarchical blend of four distinct instincts—curiosity, submission, flight, and the parental instinct ([1908], ch. xiii). Further, he distinguished systematically between various forms of religious motivation, by detailing structural variations in the hierarchies involving these four instincts. For example, he recognized the differences in the phenomenological experience and practical effects of the type of reverence which is directed on God or spirits, and the type which is directed on impersonal objects such as mountains—and he explained these differences in terms of distinct conative hierarchies underlying the two types of reverence. Consequently, by citing distinct generative histories he could

[1] These points concern the *minimal* symbolic transformations required for particular religious phenomena; it is of course possible for supernumerary religious associations to influence the phenomenological and behavioural aspects of these phenomena.

have expressed the difference between an intention to procure bread for a ritual sacrifice to a mountain, and an intention to procure bread for a thanks-offering to the spirit of the mountain or to the Christian God. Briefly, 'personal' and 'impersonal' reverence each draw on the same four instincts, but only the first involves the complex motive of gratitude (itself a binary compound, drawing on submission and the parental instinct); submission also contributes to each type of reverence through the tertiary compound of awe, but the double dose of submission involved in the one hierarchy gives to it a more 'personal' flavour than the other.

Some theorists—such as Maslow and Allport, for instance—are more eclectic than any I have mentioned so far, in allowing for a greater variety of instinctive contributions to religious belief. But they, too, insist that motivation properly termed 'religious' involves psychological complexities that belie the direct action of any basic dynamic category. They stress the everyday distinction between 'mature' and 'immature' religious motivation, and analyse this distinction in terms of different theoretical connections with the concept of the self. Allport calls the highest religious motivation (and all other motivation typical of the mature human personality) 'functionally autonomous', by which he means that the function of the dynamic complex underlying mature religious behaviour is independent of its instinctive aetiology ([1950], ch. iii; [1961], ch. x). In other words, it may be true that the origins of religion are largely sexual, probably involving transformations of the Oedipal type; but this infantile form of religion may be further developed, so as to generate a religious sentiment which is independent of the relatively crude sexual motivation underlying the early stages. Mature religious sentiment is experienced as a prime determinant of behaviour ascribed to the 'self', but this does not mean that it can be crudely egoistic in type. Someone who proudly buys the largest loaf of bread for the harvest festival, hoping that the congregation will join him in marvelling at his bounty, has a less mature religious intent than does someone who is humbly content to leave his offering unobserved, feeling no sense of pride in his own generosity. In Maslow's terms, these two purchases of bread (each of which serves the further purpose of participating in the harvest festival) are motivated by 'deficiency-needs' and 'growth-needs' respectively ([1962], ch. iii). Each may be called 'religious', since neither could be adequately explained without reference to the beliefs, values and ritual practices of the agent's religious community. But the first man is driven by his basic needs for self-esteem and the respect of his fellows, while the second feels no deficiency in these matters

and so is free to be guided rather by his higher-level needs for self-actualization and personal integrity.

Clearly, then, the motivational aspect of an admittedly religious intention may be extremely complex and varied. And whichever depth-psychology one employs to generate religious intentions, it should be adequate to express and explain psychological distinctions of which the ordinary man is intuitively aware: such as those between mature and immature belief, between the hypocrite and the true believer, between the passion of the evangelist and of the cloistered nun. Readers of the *Screwtape Letters* will need no reminder of the fiendish subtleties and devilish creativity that may be involved in the generation of self-consciously religious intentions (Lewis [1942]). To label an intention 'religious' is merely to hint at, not fully to express, its dynamic structure.

Similar remarks apply to other familiar labels attached to intentions in daily life. Let us agree that the fifth man in our example is 'commercial' in his intent, that he is amassing loaves to be sold at a profit later. A satisfactory explanation of the dynamic meaning of his surface intention would probably show it, too, to be a very complex structure.[1]

One man remains, still waiting in line outside the bakehouse. On receiving his bread, he cuts it into 3.5 millimetre cubes and lays them in a beeline to the royal palace—where the king, as promised, grants him his daughter's hand. A fairy-tale, no doubt: for in fairly-tales one expects to find royal fathers playing cat-and-mouse with the sexual desires of their prospective sons-in-law in this arbitrary fashion. But this example highlights the fact that it would be difficult—and perhaps impossible—absolutely to rule out any dynamic base for a human intention, merely by considering the nature of the particular goal substituted for the variable, '$X$'. Only the lowest and least structured conative level of all, the natural bodily expression of a simple instinct, could be thus excluded. Cutting bread into cubes is not the natural expression of the sexual instinct, or any other. But the complexity of the human mind is such that some individuals may be bread-fetishists and so consummate their basic desires in this unusual way, while others may sometimes (as in the fairy-tale) find it expedient to indulge in such behaviour as a means to a less bizarre sexual end. In other words, where human beings are concerned, any intention to $X$ may be embedded within the action-plan of any other intention, to $Y$, regardless of the dynamic base involved. Admittedly, certain values of $X$ and $Y$ will be paired only in persons who are grossly mentally deranged;

[1] For instance, consider accounts of such behaviour in terms of 'need-achievement'—cf. McClelland *et al.* [1953]; McClelland [1961].

but the fact remains that no absolute limit in principle can be put on the action-plans that may be generated in the service of any basic human purpose.

It follows that an account in terms of action-plans alone cannot fully specify the psychological structure of intentions, since such an account omits their motivational aspect. There is not even a reliable correlation between action-plans and dynamic base, because even if the action-plan prescribes behaviour (such as eating bread) that could in some circumstances be the natural expression of a basic need, this behaviour may sometimes have a rather different motivation. Definitions of intentions in terms of action-plans therefore run the risk of obscuring important dynamic distinctions between apparently similar intentions. This can be seen from the example of Miller, Galanter and Pribram, whose concept of intention I earlier described as relatively satisfactory. They define an intention as 'the uncompleted parts of a Plan whose execution has already begun', where by a Plan they mean 'any hierarchical process in the organism that can control the order in which a sequence of operations is to be performed' ([1960], pp. 61, 16). This does not seem to allow for cases of delayed intentions: sometimes an intention is formed, and an action-plan generated, with no attempt to initiate execution of the plan and with the expectation that any such attempt will be long delayed. Nevertheless, this definition emphasizes the hierarchical structure of the procedural aspect of intentions and thus allows for significant psychological distinctions between intentions which share a common goal.

But Miller and his co-authors say very little about the motivational aspect of intentions, and their definition in fact excludes this aspect since it is phrased in terms of 'Plans'. In their terminology of *Images* and *Plans*, the Image controlling behaviour includes the agent's background knowledge and also the set of valued goals through which the agent attempts to satisfy his basic needs and pressing motives. By contrast, Plans concern the specific procedures to be executed in behaviour, in order that the needs expressed in the Image may be fulfilled. Miller *et al.* insist that they differ from psychologists such as Lewin and Heider, in having 'renounced the dynamic properties of intentions' ([1960], p. 64). Their insistence rests upon the fact that they assign the dynamic, valuational aspect of intentions to what they call the Image rather than to what they call the Plan. As they put it, they concentrate on the execution of Plans rather than on their formation, the latter being governed ultimately by the Image ([1960], p. 69). In one sense, of course, they do consider the 'formation' of intentions, for they discuss what they call 'Plans for making Plans', which are strategies

for forming action-plans; but they do not ask how it is that particular goals are accepted by the agent in light of the basic motives and higher-level needs or values within his mind. Since they define 'intentions' purely in terms of the incipient execution of Plans, they underplay their motivational aspect and direct attention primarily to what I have called the procedural schema or action-plan.

## IV

The function of intentions is the control of bodily operations executed in the service of the valued purposes of the agent. Ideally, a psychological theory of intention should specify the basic bodily operations out of which large-scale intentional effects may be built up. These are the operations which are directly controlled by the basic (procedurally simple) units of action that contribute to complex procedural schemata or action-plans.

There can be no psychological answer to the question *how* such operations are effected, for *ex hypothesi* they are not compounded out of lower-level psychological units. Basic operations are carried out 'automatically', given the activation of the relevant simple procedure, and no further procedural analysis could conceivably be given. Of course, in principle a physiological answer could be given. Analogously, a high-level computer instruction (in a programming language) can be analysed into a number of instructions in the machine code; but if one asks how any one of *these* is effected, the only possible answer is in electronic (rather than programming) terms. Similarly, psychology can have nothing to say on the question of how intentions are activated. If intentions are to be executed, rather than idly entertained or held in eternal readiness, bodily control must be passed to them so that action-plans are realized in effective operations—much as executive control in a computer is continually passed to specific sections of the program. The electronic mechanisms which make this possible in cybernetic systems are known, whereas the neurological processes performing the analogous function in human brains are not. Psychology takes it for granted that this can happen, for an intention by definition is a mental phenomenon which can control behaviour; but psychology as such cannot explain how it comes about. Nor does introspection afford any clue, as William James remarked:

To the word 'is' and to the words 'let it be' there correspond peculiar attitudes of consciousness which it is vain to seek to explain. The indicative and the impera-

tive moods are as much ultimate categories of thinking as they are of grammar. . . . And the transition from merely considering an object as possible, to deciding or willing it to be real . . . is one of the most familiar things in life. We can partly enumerate its conditions; and we can partly trace its consequences, especially the momentous one that when the mental object is a movement of our own body, it realizes itself outwardly when the mental change in question has occurred. But the change itself as a subjective phenomenon is something which we can translate into no simpler terms ([1890], vol. II, pp. 568–9).

In other words, psychology can hope to explain how a particular intention arises in the agent's mind, and how complex intentional effects are compounded out of lower-level bodily operations—but only physiology could satisfactorily explain the causal basis of what James called the 'impulsive quality' of intentions.

Rather than insisting on this distinction between the psychology of intention and its physiology, however, it might be better to say that the specification of the basic bodily operations is a task falling in the borderline area between these two approaches. For many theoretical discussions that are by common consent 'physiological' are concerned with questions that are stated in functional or control-oriented terms and that therefore might understandably be called (low-level) psychological problems. And the search for basic operations readily leads one onto 'physiological' ground—particularly if one's theory of intention employs the expression *procedural schema* as opposed to *action-plan*. This is evident if one asks how basic bodily operations might be identified.

By a 'bodily' operation—whether basic or not—I mean one that is carried out by way of the causal mechanisms within the body. Bodily operations thus include not only overt motor activity, but also operations that are effected within the body and which have no overt motor aspect. Procedural schemata, that is to say, are neutral as towards intellectual and behavioural actions, since procedures may control either covert or overt operations. This tallies with ordinary usage concerning intentions to the extent that it allows for intentions controlling purely intellectual operations such as doing mental arithmetic, as well as those controlling motor effects such as raising one's arm to pass coins to a baker. Miller, Galanter and Pribram also allow for this dual possibility when they say 'the execution of a Plan need not result in overt action—especially in man, it seems to be true that there are Plans for collecting or transforming information, as well as Plans for guiding [motor] actions' ([1960], p. 17). It follows that bodily operations may include processes of 'pure thought'.

Of course, some intentions which would naturally be described as

directed to thought rather than to motor action are not so pure as they seem. This is easily seen in cases like the intention to solve an equation 'in one's head', or the intention to keep a secret; for the first of these involves linguistic procedures that could be verbally expressed and that were learnt as a form of motor behaviour in the first place, while the second involves the intentional inhibition of a specific bodily action, namely speaking the secret words. And, according to Piaget, even such 'purely intellectual' procedures as logical operations having the abstract features of transitivity and reversibility are grounded in sensori-motor schemata with equivalent features (Piaget [1954]). Procedural schemata that can be effected without overt motor action may therefore be somehow parasitic upon or secondary to schemata which were originally built up in the context of such action. But it does not follow that all thought-procedures must rest on basic operations that arise in this context. To be sure, since bodily operations by definition are grounded in physiological mechanisms, it is always in principle possible that they might be directly connected with motor mechanisms whose output is some form of overt action. But many of them in fact show up in gross bodily behaviour—and even in introspection—only very indirectly, if at all. The bodily operations involved in the intention to receive Holy Communion, for instance, include not only those constituting the motor effects (swallowing bread) but also others which are less open to view—such as the grammatical transformations involved in the liturgical section of the action-plan, and the symbolic operations of primary process thinking which—if Freud is correct—are crucial to the motivational aspect of this particular ritual intention.

The methodological problems faced by Chomsky and Freud show that identification of covert operations of thought may be very difficult. Yet identification of the strictly *basic* thought-procedures is even more taxing than such methodologies might suggest, since operations that are taken as theoretically basic by these two writers are probably effected by a number of simpler processes. Thus even the most perspicuous symbolism, the simplest Freudian association, depends on analogical relations the perception of which—whether conscious or unconscious—must be assumed to be procedurally complex. To suppose otherwise is to posit an absolutely direct or completely automatic linkage between the two items associated.[1]

[1] In discussing the 'general concept of analogy which dominates our interpretation of vision', Von Neumann has argued that 'it is futile to look for a precise logical concept, that is, for a precise verbal description, of "visual analogy". It is possible that the connection pattern of the visual brain itself is the simplest logical expression of this principle' ([1956], p. 2091). He is not merely saying that it is the rain which executes the operations involved in our recognition of (for instance)

Similarly, the 'simple' insights that bread can be bought from bakers and that the corner-shop is a bakery must depend upon many individual procedures of data-processing, probably including operations analogous to recording a definition in the memory-store, retrieving it when called upon, and registering a new object on the appropriate list; moreover, if these insights are to be of any effective use to a man intending to buy bread then they must somehow be transferred from his memory to that part of his mental organization which is analogous to the processor in a computer. The appearance of cybernetic terminology (including 'procedural schema') in this context is no accident, because the detailed procedural structure of computer programs provides the best source of suggestions for possible basic thought-operations in men's minds. This is not to say that the processes involved in human thinking are precisely the same as those involved in current programming science. But there is no more direct way of suggesting hypotheses for identifying such low-level psychological operations; nor is there any physiological theory sufficiently detailed to identify their causal basis in human brains.[1]

The identification of basic operations effecting motor action, as opposed to information-processing alone, is somewhat less problematic. But even the motor units basic to intentional action are not immediately obvious—and a theory of intention expressed in terms of *action-plans* risks missing structural distinctions that are more readily made in terms of *procedural schemata*. This is particularly clear in philosophical discussions of basic actions, where ordinary usage of the terms 'intentional' and 'action' influences the argument considerably.

the visual analogy between different members of the class of conical objects; he is claiming that those operations cannot be expressed in a neat logical system abstracted from the contingencies of neurophysiological connection. If he is right, then the operations basic to the appreciation of analogy could not be expressed in the form of procedures within a computer program (though they might be directly embodied in the hardware of certain machines, as they are *ex hypothesi* embodied in the brain). Recent advances in the programming of object recognition tend to belie this scepticism—but even on Von Neumann's view one would need to draw a distinction between relatively simple (or direct) analogies, and relatively complex ones, in some sense dependent on underlying analogies of a simpler kind. For instance, the Freudian symbolism of Eucharistic bread that is exploited unknowingly by priest and congregation is certainly more complex than the phallic symbolism of bottles and bananas that is consciously exploited by advertisers.

[1] Some philosophers would even hold that covert psychological processes like those I have postulated are a myth: Malcolm's ([1971]) rejection of 'processes of recognition' clearly implies that he would deny any hidden procedural structure to intentions. For a stringent critique of Malcolm's arguments, see Martin (forthcoming).

In recent years a number of philosophers have attempted to characterize what might be called basic executive elements of intention, motor actions which are not generated from other actions in any way. The seminal discussion of this topic was provided by Danto, who distinguished 'basic actions' within the agent's natural behavioural repertoire from 'non-basic actions' which are somehow compounded out of them through the intentional causation of the agent ([1965]). Abilities to perform basic actions were referred to by Danto as 'gifts', comparable to the gift of sight; and basic actions themselves were said to be 'simple', not compounded out of anything more elementary than themselves. When one raises an arm, for example, one cannot say *how* one does so in the sense of giving a 'recipe' (action-plan) for arm-raising, nor is there anything which one has to do first in order then to be able to raise one's arm. It is this introspectively simple character of the action-plans controlling execution of motor effects within the basic repertoire which led Danto to deny that such effects are caused by the agent at all. Allowing that basic actions are (intentionally) 'performed' by the agent, he insisted that they are not 'caused' by him—at least not in the sense in which the agent 'causes' his non-basic actions. It follows that, although a man may be said to cause the removal of a loaf from the breadbasket, he cannot in the same sense be said to have caused his arm to rise when lifting the loaf from its original position. Other writers have found this claim paradoxical, and in accepting Danto's central distinction they have analysed it rather differently so as to avoid this denial that the agent causes his basic actions. For instance, Chisholm defines basic actions as 'those things we do without having to do other things to get them done', and explicitly rules out Danto's paradoxical conclusion ([1971], p. 64). Again, Goldman gives a detailed discussion of basic actions in which he emphasizes that, although they are caused by the agent, they do not depend in any way on his knowledge of physiological cause and effect or of any means-end dependencies. They form the given basis for any plan of action, higher-level actions being generated out of them; consequently, though basic actions are intentionally caused by the agent, no sense can be attached to the notion of forming an action-plan in order to generate them (Goldman [1970], pp. 63–72). Still other analyses of basic actions have been prompted by Danto's original paper: though they differ in detail, they all stress the relatively minimal structure of the intention to raise one's arm,[1] and they would all agree that the act of buying a loaf of bread, for example, involves high-level actions of some complexity.

[1] Rescher ([1970]) raises the question of the infinite divisibility of action: perhaps raising one's arm involves indefinitely many component actions of raising it half an

Precisely what are the low-level actions contributing to bread-buying, however, is a question that they would answer rather differently, for they disagree as to what items should be included on the basic list. Some would allow that opening the baker's door is a basic action, others would not; some would accept that walking to his shop is one basic action, whereas others would analyse it into distinct steps; some would admit the pronunciation of the various phonemes in the word 'wholemeal' as basic, while others would hesitate to do so. However, none would accept finely detailed muscular movements as suitable candidates for basic actions.

At least three matters of psychological importance are involved in this philosophical argument. The first is the question whether the basic executive units of intention must themselves be classifiable as 'actions' in the ordinary sense of the term. All the philosophers I have mentioned assume that they must be so classed; they regard action-plans as plans for action which are compounded out of other actions. It is essential to the concept of intentional action as it is ordinarily used that it be procedurally flexible in some degree, so tending to achieve the desired end by appropriate variation of means should obstacles to the goal arise. Consequently, raising one's arm has to be regarded as a basic action, one which can be achieved without the mediation of any other purposive action. For no means to the end of raising one's arm are evident in gross behaviour, and nor are such means introspectible by the agent. Indeed, no clear sense can be attached to the notion of envisaging such means. If one wishes to raise one's arm one simply does so, and the anatomical knowledge that such and such a muscle is causally involved does not assist this performance in any way. Introspectively speaking, then, raising one's arm is an action performed 'directly', without the need for an action-plan. However, Lashley's classic discussion of the physiological mechanisms underlying motor skills showed that physiological schemata of a hierarchical type must be posited in order to account for the control of integrated actions and skilled movements ([1951]).[1] In other words, there is a highly structured procedural schema

inch? He counters by appealing to the intensionality of action: the agent did not perform the actions of raising his arm through successive half-inches because he did not think of, or intend, the action in this sense—though he could have done so, had he wished.

[1] The motor effects of what Lashley termed 'schemata' are intrinsically different from the motor effects of mere associative strings of reflexes, and this difference is a difference in the generative structure of control. Reflex control could not account for the anticipations typically observed in skilled action—as when a pianist's arm and fingers are raised in different ways to strike a given key, according to the notes yet to be played. Similarly, the organization of intentional behaviour could not possibly be controlled purely by the feedback provided by a continuous series of

controlling the introspectively simple action of raising one's arm. Indeed, even the reflex movements of animals low in the phylogenetic scale (and incapable of 'intentional action' properly so-called) involve centrally controlled motor co-ordination. The flexion of any joint, for instance, requires reciprocally adjusted activity on the part of antagonistic flexor and extensor muscles, and this muscular synergy is centrally controlled. In physiological terms, therefore, 'simply' raising one's arm is dependent on highly structured processes at the shoulder and elbow joints: but the procedural schemata concerned do not have the evident means-end variability of introspectively accessible action-plans. A psychological theory of intention expressed in terms of *procedural schemata* is somewhat better suited for integration with a physiological approach to motor action than is one expressed in terms of *action-plans*, since there is no implication that basic 'procedures' must control fully purposive operations which could themselves be classed as 'actions'.

Secondly, as Lashley remarked in his paper on motor skills, high-level procedural schemata may be gradually and painfully built up by training and practice, and then control motor action 'directly'. Behaviour that initially has to be consciously intended and carefully planned often comes to be performed effortlessly and 'automatically', so much so that introspective concentration on the motor details—the basic actions involved—may entirely disrupt performance. Driving to the bakehouse, for instance, involves bodily skills that may have taken months of careful effort to perfect, but the driver apparently performs them as simply as raising his arm. He may even have difficulty in telling a learner 'how' he changes gear, for example. Changing gear is not an item which Danto would accept on his basic list: it is not a gift, as many who have failed the driving-test know to their cost; nor is it simple in not being compounded out of anything more elementary. Yet, introspectively considered, it is a simple matter requiring no special attention from the practised driver. Some philosophers would therefore say that it should be included within the practised driver's repertoire of 'basic actions'; that a distinction should be made between 'simple' and 'basic' actions (arm-raising qualifying as both); that the necessity of attention to the details of action should be a prime criterion of 'non-basic' actions; and that, since some basic actions have to be learned, not all basic actions are gifts (cf. Martin [1972]). However one chooses to settle these

kinaesthetic sensations or stimuli: a tightly controlled arpeggio, for instance, may be executed so quickly that the speed of neural conduction would not allow for afferent messages from the fingers to be reflected in efferent impulses to the muscles of the hand (cf. Lashley, *op. cit.*).

terminological points, it is clear that there is an important psychological distinction between action which requires care and attention in the monitoring of its progress and action which does not. In so far as a particular intention to buy bread involves an action-plan whose execution requires careful attention, it is a very different phenomenon from one whose procedural schema can be effected relatively automatically. A psychological theory should be adequate to represent this difference between two superficially similar intentions.

Thirdly, even paradigm cases of basic actions are usually not included within the infant's repertoire: no baby can walk, nor raise his arm except in a rather clumsy fashion. This point also has been remarked by some philosophers, though Danto did not dwell on it (cf. Martin, *op cit.*). Ideally, psychological accounts of the development of motor action in terms of increasingly efficient sensori-motor procedural schemata should be integrated with physiological accounts identifying the causal basis of the effective operations evident in infantile and adult behaviour. For instance, a recent theory of cerebellar function, based on detailed anatomical data about the neuronal pathways to and from the cerebellum, suggests how introspectively simple acts such as raising one's arm may develop from a base of much more elementary operations (Blomfield & Marr [1970]). A set of elemental muscular movements are supposed to be initiated by the deep pyramidal cells of the motorsensory cortex, and some of these movements are specifically inhibited by individual Purkinje cells in the cerebellum. The pattern of inhibition is initially guided by the superficial pyramidal cells of the motorsensory cortex, but because of the mediation of the mossy and parallel fibres of the cerebellum the inhibitory 'contexts' are learned by the Purkinje cells, which can then function autonomously in controlling skilled movements. This theory would account for the increasing smoothness and co-ordination of arm-raising in a human baby by appealing to procedural schemata based on elemental motor operations that are conceived of at a much more detailed level than are any philosophers' candidates for 'basic actions'. An adequate theory of intention should include a developmental section detailing the differentiation of adult intentions out of their infantile precursors, taking into account the motivational, procedural, and operational aspects of their structure. The discussion of the present paper implies that since a babe-in-arms has neither Oedipus complex, nor knowledge of the names or effects of poisons, nor precise motor co-ordination, he cannot possibly generate the intention to spread a lethal dose of arsenic on his father's toast. A satisfactory developmental theory of intention would show how it comes about that his older brother

might possibly join the baker's queue with the intention of doing just that.

## V

In sum, the psychological nature of intentions is highly complex. Every intention has a motivational, a procedural, and a bodily operational (though not necessarily an overt motor) aspect, each of which has to be described in terms of its own particular structure. Characterization of an intention in terms of its immediate goal indicates only the surface nature of an extraordinarily rich phenomenon. The number of psychological realities that could be correctly identified as 'the intention to buy bread', for instance, is indefinitely large. In order to distinguish between them a structural theory of intention is required.

Many psychologists refuse to accept 'intention' and other terms of everyday phenomenology as items proper to a scientific psychology. Even those psychologists who do accept such terms often conceptualize intentions in a way that does less than justice to their structural complexity. For example, Heider follows Lewin in regarding intentions as forces exerting pressure within the agent's life-space: but this 'field-theoretical' approach obscures the fact that, in so far as intentions may be thought of as forces, they are 'forces' with a finely detailed inner structure rather than simple vectors pushing in a linear direction (Heider [1958], pp. 82–112).

Any satisfactory theory of intention must recognize and explain their inner structure, showing how it relates to the controlling function of intentions in thought and overt behaviour. A psychological theory of intention that does not attempt to do this is almost as unsatisfactory as one which refuses to admit intentions as psychological phenomena at all.

*University of Sussex*

## REFERENCES

ALLPORT, G. W. *The Individual and his Religion.* New York: Macmillan, 1950.

ALLPORT, G. W. *Pattern and Growth in Personality.* New York: Holt, Rinehart, & Winston, 1961.

BLOMFIELD, S. & MARR, D. 'How the Cerebellum May be Used', *Nature*, 1970, **227**, 1224–8.

BODEN, M. A. *Purposive Explanation in Psychology*. Cambridge, Mass.: Harvard University Press, 1972.

CHISHOLM, R. M. 'On the Logic of Intentional Action', in R. Binkley *et al.* (eds.), *Agent, Action, and Reason*. Oxford: Basil Blackwell, 1971. Pp. 38–69.

DANTO, A. 'Basic Actions', *American Philosophical Quarterly*, 1965, **2**, 141–8.

DARWIN, C. *The Descent of Man, and Selection in Relation to Sex*. London: John Murray, 1871.

FREUD, S. *The Psychopathology of Everyday Life*. Many editions—first published 1901.

FREUD, S. *Totem and Taboo*. Many editions—first published 1913.

FREUD, S. *The Future of an Illusion*. Many editions—first published 1927.

GOLDMAN, A. I. *A Theory of Human Action*. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

HEIDER, F. *The Psychology of Interpersonal Relations*. New York: Wiley, 1958.

JAMES, W. *The Principles of Psychology*, 2 vols. New York: Holt, 1890.

LASHLEY, K. S. 'The Problem of Serial Order in Behaviour', in L. A. Jeffress (ed.), *Cerebral Mechanisms in Behaviour: The Hixon Symposium*. New York: Wiley, 1951. Pp. 112–35.

LEWIS, C. S. *The Screwtape Letters*. London: Geoffrey Bles, 1942.

MCCLELLAND, D. C. *The Achieving Society*. Princeton: Van Nostrand, 1961.

MCCLELLAND, D. C., ATKINSON, J. W., CLARK, R. A. & LOWELL, E. C. *The Achievement Motive*. New York: Appleton-Century, 1953.

MCDOUGALL, W. *An Introduction to Social Psychology*. London: Methuen, 1908.

MALCOLM, N. 'The Myth of Cognitive Processes and Structures', in T. Mischel (ed.), *Cognitive Development and Epistemology*, New York: Academic Press, 1971. Pp. 385–92.

MARTIN, J. R. 'Basic Actions and Simple Actions', *American Philosophical Quarterly*, 1972, **9**, 59–68.

MARTIN, M. 'Are Cognitive Processes and Structure a Myth?' forthcoming in *Analysis*.

MASLOW, A. H. *Toward A Psychology of Being*. Princeton: Van Nostrand, 1962.

MILLER, G. A., GALANTER, E. & PRIBRAM, K. H. *Plans and the Structure of Behavior*. New York: Holt, 1960.

PIAGET, J. *The Construction of Reality in the Child*. New York: Basic Books, 1954.

RESCHER, N. 'On the Characterization of Actions', in M. Brand (ed.), *The Nature of Human Action*. Glenview, Ill.: Scott Foresman, 1970. Pp. 247–54.

STARBUCK, E. D. *Psychology of Religion*. London: W. Scott, 1899.

TROTTER, W. *Instincts of the Herd in Peace and War*. London: Ernest Benn, 1916.

VON NEUMANN, J. H. 'The General and Logical Theory of Automata', in J. R. Newman (ed.), *The World of Mathematics*. New York: Random House, 1956. Vol. IV, pp. 2070–98.