VU Research Portal

Impulsivity in the eye of the beholder: an analysis of teachers' concepts of impulsive and reflective behaviour.

Visser, M.R.M.; Das-Smaal, E.A.; Feij, J.A.

Link to publication in VU Research Portal

citation for published version (APA)
Visser, M. R. M., Das-Smaal, E. A., & Feij, J. A. (1993). Impulsivity in the eye of the beholder: an analysis of teachers' concepts of impulsive and reflective behaviour. *The European Journal of Personality*, *7*, 47-63.
https://doi.org/10.1002/per.2410070105

Impulsivity in the eye of the beholder: an analysis of teachers' concepts of impulsive and reflective behaviour

Mechteld R. M. Visser, Edith A. Das-Smaal and Jan A. Feij

Free University, Amsterdam, The Netherlands

Abstract

The aim of this research was to investigate teachers' perception of the concept of impulsivity and its relation to the concept of reflectivity. Teacher rating scales for both concepts were constructed by means of the prototype method (Study 1). It appeared that impulsivity refers to social behaviour, whereas reflectivity is more cognitive in character. A Principal Components Analysis (Study 2) showed that the item pools for impulsive and reflective behaviour account for separate components. It is concluded that impulsivity and reflectivity as perceived by teachers are not two extremes of one dimension, but refer to different behavioural domains: social and cognitive.

INTRODUCTION

The term 'impulsivity' is often used in discourse; yet its exact meaning remains unclear. As part of a research project on attentional problems and impulsive behaviour at school (Das-Smaal, 1989), the present investigation aimed at clarifying the construct of impulsivity as it exists in the minds of teachers. What do they mean when they use the term 'impulsivity'? How, and in what type of situation, is impulsivity manifested in children's classroom behaviour? In answering these questions, the study reported here remains at the purely descriptive level by using a prototype approach, which is a method for making implicit ideas of people more explicit. The search for explanations and determinants of impulsive behaviour will be a matter of subsequent research.

Impulsivity as a behavioural style has received a great deal of attention. It is generally recognized that it plays an important part in childhood behavioural problems. In the literature it is mentioned as a general symptom of a broad range of such problems (Cantwell, 1988; Milich and Kramer, 1984; Sergeant, Van Velthoven and Virginia, 1979). It also appears to be one of the most enduring symptoms among

adults originally diagnosed as hyperactive (e.g. Hopkins, Perlman, Hechtman and Weiss, 1979; Weiss, 1985). At schools, together with growing attentional problems, many teachers point out an increase in impulsive behaviour among children (Das-Smaal, De Leeuw and Orlebeke, 1987). This may have negative consequences because the lack of reflection that is thought to be typical of the impulsive child is often disadvantageous to school performance (see, for example, Blackman and Goldstein, 1982; Messer, 1976).

The importance of impulsivity as a symptom appears to be inversely proportional to the clarity of its definition. Despite its attached significance, impulsivity is a poorly defined concept. Moreover, there is no general agreement about how it should be measured. Yet there is one very commonly used measure of impulsivity—the Matching Familiar Figures Test (MFFT; Kagan, Rosman, Day, Albert and Phillips, 1964). The MFFT is a matching to sample test that requires the subject to find which one of six alternatives is exactly like a standard figure. Relevant variables are the time used to solve the problem and the number of errors made. Taking a long time but making few errors is thought to be indicative of a reflective attitude, while the opposite is defined as an impulsive response style (Kagan *et al.*, 1964). So, with this test impulsivity and reflectivity are considered to be the extremes of one dimension, varying on the degree of reflection spent in problem-solving situations.

Impulsivity studies using the MFFT have shown some positive findings. In a review, Messer (1976) reported a differentiation between clinical and non-clinical groups on the MFFT, and a relationship between MFFT-reflectivity, on the one hand, and motor inhibition, accurate visual scanning, and more advanced problem-solving strategies, on the other hand. Various cognitive conceptualizations of impulsivity have been mentioned following the work of Kagan. These involve, among others, an explorative instead of goal-directed search (Wright and Vlietstra, 1975); a lack of systematic, planful behaviour (Wagner and Cimiotti, 1975); a preference for holistic rather than analytic information processing (Zelniker and Jeffrey, 1976); a lack of motor inhibition (Milich and Kramer, 1984); and a rate of information processing that is out of synchrony with task demands, i.e. a timing deficit (Barratt, 1985a).

However, the MFFT measure of impulsivity also became the subject of much criticism. There appear to be both methodological and conceptual problems. The criticism concerns predominantly the construct validity (e.g. Block, Block and Harrington, 1974; Grimm and Meyer, 1976), the reliability (Egeland and Weinberg, 1976), the sample-dependent way of scoring by using the median-split method and the concomitant discarding of two groups of subjects (i.e. the fast-accurates and the slow-inaccurates; see Salkind and Wright, 1977), indistinctness about which aspects of functioning are measured (Pick, 1983), and, in general, a lack of theoretical foundation (Tiedeman, 1983).

Despite this criticism, the MFFT is still a very popular measure of impulsive behaviour, not only in scientific research but also for diagnostic purposes. This implicates that in practice non-reflectivity is often identified with impulsivity. With this in mind, it was decided in this study to investigate not only the concept of *impulsivity* as it exists in the teacher's mind, but also its relation to the concept of *reflectivity*. Do teachers indeed consider impulsivity and reflectivity the extremes of one dimension or do they see these as related but different concepts? In this context, it should be mentioned that from a study by Milich and Kramer (1984) it seems conceivable that impulsivity, as rated by teachers, has more than one component. Milich and

Kramer have suggested that, regarding impulsive behaviour, teacher ratings tap both cognitive and social components, whereas laboratory tasks for impulsivity may measure primarily the cognitive component. If this is true, it would mean a great advance if these distinct components could be established and separated in a teacher rating scale.

In the area of personality research it seems an established fact that impulsivity cannot be seen as one homogeneous concept. Factor analytic studies show, time after time, that impulsivity is broken down in several subfactors. For example, Gerbing, Ahadi and Patton (1987) found, by factor-analysing a large amount of impulsivity-related questionnaires and a number of behavioural measures, that impulsivity comprised three second-order factors: Avoids Planning, Decisive, and Spontaneous. This result resembles the factor structure demonstrated in the BIS-10, which is the most recent Impulsivity scale developed by Barratt (1985b). The BIS-10 is also composed of three factors: Motor Impulsiveness (similar to Spontaneous), Cognitive Impulsivity (similar to Decisive) and, again, Non-planning. Eysenck, Pearson, Easting and Allsop (1985) propose only two impulsivity-related factors. The first factor is Impulsivity, correlating to neuroticism and psychoticism. The second factor is Venturesomeness, correlating to extraversion. To investigate to what extent the BIS-10 and the I-7 (Eysenck *et al.*, 1985) measure the same construct, a joint factor analysis on the items of both scales was conducted (Luengo, Carillo-de-la-Peña and Otero, 1991). Again, three second-order factors emerged. The first refers to Premeditation vs. Impulsive Action (both motor and cognitive components); the second one refers to Non-planning and Venturesomeness; and the last, rather small, factor refers to Concentration Ability. Taking this all together, a more or less coherent picture arises. There appear to be two rather stable components of impulsive behaviour, one representing both the *cognitive* and the *motor* component of acting on impulse, and the other representing a *carefree, non-planning* life-style. *Concentration problems* seem to be a small, separate factor.

At this point, it seems evident that impulsivity is a heterogeneous concept. The scope of the present study was limited to the concept that teachers have about impulsivity and its relation to the concept of reflectivity. The question to what extent the subdivisions made in the more general field of personality theory are similar to the concepts investigated in this study is subject of the Discussion section of this paper.

As Sternberg (1985) emphasized, when a term is frequently used and its definition is insufficient, implicit theories can be of great interest. This is true especially in the present case, where the aim was to investigate impulsive behaviour as reported by the teachers. In that case, it is very useful to know first what teachers mean when they characterize a child as impulsive. Subsequently, the relationship between their conceptions and measures derived from explicit theories has to be determined, as well as the mutual connections among these measures. Together, this will produce a differentiated picture of specific patterns of functioning, including preferential styles of information processing that are associated with impulsivity.

Implicit theories, conceptualizations that reside in the minds of people, can be investigated by using a prototype analysis. In a prototype view, category membership is a matter of degree. Categories are organized around a prototype or typical example, surrounded by exemplars of decreasing typicality to the category. A concept such as impulsivity, for instance, can be viewed as a category of characteristics or

behaviours that differ in the extent to which they are considered typical of the category. Prototypicality refers to differences among category exemplars in judged typicality or resemblance to the prototype. Acting before thinking, in the example, may be considered more typical of impulsivity than difficulty in organizing work. People can be asked to list impulsive behaviours, and these behaviours can then be rated on how good an example they are of impulsivity. In this way, the understanding of the concept of impulsivity by a specific group of persons can be uncovered. It can be conjectured that prototypes in themselves do not constitute a particular representation or process model (Rosch, 1978), but prototype effects are now generally acknowledged to be real and omnipresent (Lakoff, 1986). They are reported to occur in many types of categories, and these need not necessarily be just the fuzzy, ill-defined ones (Das-Smaal, 1990; Fehr and Russell, 1984).

Besides uncovering implicit thoughts about personality constructs, the method has another application. As a scale construction method, the principle yields a strategy for item selection. This can be accomplished again by presenting people with a previously generated item pool and asking them to judge the items on typicality to the concept involved. A scale can then be composed using items of the highest judged typicality. It has been shown that this prototype scale construction strategy has a favourable effect on the scale validity (Borkenau, 1988; Broughton, 1984, 1990; De Jong, 1988).

The prototype approach is unspecific with respect to the role of the situational context (Block, 1989). In psychological research more generally, there has been a tendency to ignore the influence of situations (e.g. Magnusson, 1984). Yet it is clear that, when studying behaviour, situational conditions can be very important. Personality traits or cognitive styles may either become manifest or not, depending on the situation. Examples are social context, type of activity in which someone is involved, situation of success or failure, etc. Therefore, in this study various school situations were explicitly taken into consideration. The situations were based on the general taxonomy of situations constructed by Van Heck (1984, 1989), which fits the local culture.

To summarize, the main aim of the present study was to clarify the concept of impulsivity and its relation to the concept of reflectivity. Given the importance of the impulsivity trait in childhood behavioural problems and the relevance to functioning at school, the study focused on what teachers have in mind when they speak of impulsive children. In addition, the concept of reflectivity, a supposed opposite of impulsivity was investigated. Special attention is given to its relationship to impulsivity. To examine and operationalize the meanings of the concept of impulsivity and the concept of reflectivity, a prototype scale construction strategy was employed. School-relevant situations were explicitly taken into account in this study.

PRESTUDY: GENERATION OF BEHAVIOUR AND SITUATION DESCRIPTIONS

In a prestudy, teachers were asked to generate descriptions of impulsive and reflective behaviours following the 'Act Nomination Procedure' (ANP; Buss and Craik, 1980). Next to a general procedure, also a situation-specific variant was used. To this aim, a taxonomy of school situations was developed.

Method and procedure

Subjects were 20 Dutch primary school teachers, ten from ordinary primary schools and ten from schools for children with learning and educational problems (LOM). All teachers gave permission for participation by telephone.

The teachers received all instructions by mail. First, a general variant of the ANP was used. The instructions for this procedure were as follows (translated from Dutch):

> I would like you to call to mind the pupil of your class who you think is the most impulsive one. Write down his/her name or initials. Then write down five behaviours that you think are most indicative for their impulsiveness.

After that, they were asked to do the same for a pupil of the opposite sex. This procedure was repeated for reflectivity. Because the direct translation of reflectivity, *reflectiviteit*, is not a common word in the Dutch language, the more usual translation *bedachtzaamheid* was added in brackets.

After this general approach a situation-specific procedure followed, using 13 situations frequently occurring at school. Teachers were instructed as follows (translated from Dutch):

> Below, you will find several descriptions of situations as they occur at school. I would like you to describe how the impulsive/reflective behaviour will manifest itself in that specific situation for the same four pupils you had in mind earlier. One description per pupil will do. Of course, it is possible that in a specific situation no characteristic behaviour will occur to you. If so, write down 'no information' and, in any case, do not make anything up.

The 13 situations specified in this ANP variant were selected in advance. To this goal, 15 other primary school teachers of the fourth, fifth, or sixth form were first asked to write down the main situations as they occurred at school. Although this question was rather aspecific, all teachers returned about 15 situational descriptions. Then the descriptions were classified by two judges independently, according to the situation taxonomy of Van Heck (1984, 1989). This taxonomy discerns ten general situational factors. It appeared that five out of ten factors were not represented within the generated school situations, whereas some of the school situations could be classified in more than one general category. For example, the situation 'The children are doing a play at school' was classified as 'interpersonal relations' and 'recreation' (Factor 3 and Factor 4 respectively in Van Heck's scheme). Five general factors appeared relevant to school situations (see Table 1). For each of these, the judges selected the most general description to represent the factor. Whenever it was impossible to select one general description, more descriptions were included. Eventually, 13 situations were selected to be used in the ANP (see Table 1).

Results and discussion

It appeared that after completion of the ANP, behaviour descriptions generated with situation number 12, 'The children receive physical training', had to be excluded. Some teachers did not give physical training themselves and were therefore unable to observe their pupils in this situation.

Table 1.   School-relevant situations and situation factors*

	Relevant situation factors			
School-relevant situations	2	3	4	5
1. The teacher gives classical instructions	x			
2. The children are doing a task independently	x			
3. The children are doing a task in small groups	x	x		
4. The teacher tells a story				
5. The children are doing a test	x			
6. Break (*Speelkwartier*)		x		
7. A group discussion is being held	x	x		
8. The children are doing a play		x		
9. The children have an excursion				
10. Something is celebrated in school		x		
11. The children are going into/out of the school building				
12. The children receive physical training				x
13. The children are doing something for themselves				

Note: All situation descriptions are translated from Dutch.
* Van Heck (1989), situation factors: 1. interpersonal conflict; 2. joint working, sponsored teaching; 3. interpersonal relations; 4. recreation; 5. travelling; 6. religious and other rituals; 7. sport; 8. excesses; 9. serving; 10. trading.

Taking this into account, the ANP resulted in an initial item pool of 548 impulsive behaviour descriptions (127 general and 421 situation-specific). For reflective behaviour, 500 descriptions were generated (128 general and 372 situation-specific). Identical formulations were left out.

Because of redundancy, the descriptions were condensed. First, unclearly formulated items were removed. Subsequently, two judges selected the items which referred to the same behaviour and condensed them into one formulation. For instance, the item 'Concentrates when the teacher gives instructions' and the item 'Is attentive when the teacher gives instructions' were condensed by taking only the first formulation. Whenever the two judges did not agree, both descriptions were included. Eventually, this yielded 162 Impulsivity items (43 general, 119 situation-specific) and 144 Reflectivity items (40 general, 104 situation-specific).

From this prestudy, it can be concluded that item generation for both impulsive and reflective behaviour appeared to be no problem for the teachers. In particular, the large number of descriptions generated in the situation-specific condition is for both concepts a clear demonstration of this fact. As can be expected, the prestudy also shows that the situations relevant for school do not cover all the possible situational factors described by Van Heck (1984, 1989). It should be noted that this may have implications for the generalizability to other contexts.

STUDY 1: PROTOTYPICALITY RATINGS AND SCALE CONSTRUCTION

In this study, impulsive and reflective behaviours (see Prestudy), together with the items of an existing list for social impulsivity (Wels, 1989), were rated in terms of

prototypicality. Subsequently, the most prototypical items were used for scale construction.

Method

Subjects

One hundred-and-twenty teachers of the fourth, fifth, or sixth form of Dutch primary schools took part in this study. After giving consent for participation by telephone, they received one of the rating forms by mail. The return percentage was 72 per cent, which is fairly high; especially if it is taken into account that the lists were sent during a busy period, namely at the end of the school year.

Materials and procedure

The material embodied two equivalent rating lists, Form A and Form B. Form A was composed of 95 impulsive behaviour items and 75 reflective behaviour items. Form B contained 95 impulsive behaviour items and 69 reflective behaviour items.

The Impulsivity items were selected from two sources: the condensed Impulsivity item set generated by the ANP (see Prestudy), and the 34 items of the Questionnaire for Social Impulsivity (Wels, 1989). Six items from the first source were left out because they were almost identical to items from the second source. This resulted in an item pool of 190 Impulsivity items. The condensed set of 144 Reflectivity items (see Prestudy) represented the Reflectivity items.

Because of the large number of items, the total item pool was split into two equivalent parts, Form A and Form B. Both forms embodied a section with impulsive behaviour items and one with reflective behaviour items. The general and situation-specific items were presented in a random order. Each teacher received either Form A or Form B. Judges were instructed to rate the Impulsivity items on prototypicality for impulsive behaviour and the Reflectivity items on prototypicality for reflective behaviour. Judgements had to be given on a 4-point scale, ranging from 'very uncharacteristic' to 'very characteristic'.

Results and discussion

Three of the teachers, on their own account, transformed the 4-point scale into a 7-point scale: their judgements were excluded from further analysis. Taking this into consideration, Form A was used by 41 judges and Form B by 42 judges.

Table 2 presents the reliability data. Cronbach's alpha was high in comparison with other research (Buss and Craik, 1980; Rosch and Mervis, 1975). However, as Block (1989) says, 'the reliability or reproducibility of a set of average scores is generally much higher than the coefficient found when the prototypicality ratings of each judge are correlated with the prototypicality ratings of every other judge'. Therefore, the intraclass correlations (Shrout and Fleiss, 1979) are also given. As is apparent from Table 2, agreement among judges was somewhat low for impulsive behaviour. A possible explanation for this can be found in the supposed inhomogeneity of the impulsivity concept. As was stated in the Introduction, the concept of impulsivity includes several subfactors, covering a wide range of behaviours. Therefore, it is not inconceivable that this category includes many less prototypical

Table 2.   Reliability data: the intraclass correlation (*r*)
and Cronbach's alpha (*a*)

	Impulsivity		Reflectivity	
	List A	List B	List A	List B
r	0.19	0.29	0.39	0.29
a	0.92	0.94	0.97	0.97

Table 3a.   Most prototypical items for impulsivity

Impulsivity item	Mean prototypicality
1. Is inclined to react immediately when he/she sees something happen	3.77
2. Is inclined to react immediately when he/she hears a sound	3.65
3. Has difficulty awaiting his/her turn in a group discussion	3.56
4. Is inclined to react immediately when something is told that is not intended for him/her	3.49
5. Always reacts in a group discussion to what others say	3.47
6. Is spontaneous	3.46
7. Is inclined to react immediately after the slightest hearing of an explanation	3.44
8. Is inclined to interfere when the teacher poses a question to another child	3.40
9. Wants to touch an object immediately he/she sees one	3.39
10. Is inclined to take over another child's turn	3.37
11. Has difficulty sitting still for a long time	3.35
12. Calls out in the classroom	3.34
13. Reacts many times to class instructions first	3.30
14. Starts working on a problem without analysing it first	3.29
15. If it is a rule that children may not start on something before they have asked permission, he/she is inclined not to obey	3.27

Note: All items are translated from Dutch.

behavioural instances on which prototypicality agreement is not very high. Probably this applies only to a lesser degree to the concept of reflectivity.

As a basis for the further development of a teacher rating scale, the 15 most prototypical items for impulsivity and the 15 most prototypical items for reflectivity were selected. Besides prototypicality ratings, another decision criterion was applied. This concerned the issue of several items describing the same behaviour, one being a general description and the other(s) being situation-specific. The rule applied in this case was to keep the most prototypical kind of description(s).

The items of the Impulsivity scale and the Reflectivity scale along with the mean prototypicality of each item are presented in Tables 3a and 3b. Impulsivity refers to the tendency to react immediately with respect to all kinds of stimulus, i.e. hyper-reactive behaviour. On the other hand, reflectivity refers, for example, to concentration, motivation, systematic work, and the ability to work independently. Reflectivity is probably best summarized as a good working attitude.

Table 3b. Most prototypical items for reflectivity

Reflectivity items	Mean prototypicality
1. Works in a well-considered way	3.66
2. Listens well when the teacher tells a story	3.56
3. Concentrates when listening to the teacher's instruction	3.51
4. Prepares well for a test	3.50
5. Listens to the explanation before turning to work	3.46
6. Is quiet	3.46
7. Works on a test with full effort	3.42
8. Likes to produce good work	3.42
9. Works on tasks with concentration	3.34
10. Is able to concentrate well on a test	3.27
11. Checks a test before handing it in	3.26
12. Works systematically when carrying out an order/task	3.24
13. Keeps to the rules of a group discussion	3.24
14. Asks for help during individual work only if strictly necessary	3.24
15. Is able to work on tasks independently	3.23

Note: All items are translated from Dutch.

To get an impression of the kind of situations in which impulsive and reflective behaviours most commonly occur and to see whether there are any differences among the situations in which both kinds of behaviour manifest themselves, the situation descriptions which occurred four times or more in the most prototypical items (>3.0) were inspected. It appeared that the typical situation in which impulsive behaviour manifests itself is during a group discussion. This is pre-eminently a situation of social interaction. The typical situations where reflective behaviour manifests itself are (1) listening to classical instruction, (2) doing a task on your own, and (3) test situations. This is an interesting finding in relation to school achievement. The more cognitive nature of the situations in which reflectivity is manifested makes this concept presumably more important to school achievement than 'social' impulsivity.

Furthermore, the contrast between the *social nature* of impulsivity and the *cognitive nature* of reflectivity also raises the suspicion that the concepts, as conceived by teachers, are not merely two logical opposites of one behavioural dimension. A separate status for both concepts seems to be more justified. In Study 2 an attempt was made to examine this issue.

Finally, it should be noted that 8 out of 15 items for our Impulsivity scale appeared to come from the 'Social Impulsivity' list of Wels (1989). The fact that these items were selected both by the prototype method and by the more traditional way of item selection used by Wels (see Stunnenberg and Verwey, 1985) supports their validity as measures of impulsivity. [The total list of Wels (1989) consisted of 34 items; the mean prototypicality was 2.95, which is fairly high considering a maximum score of 4.]

STUDY 2: CONSTRUCT VALIDATION

In Study 2, the Teacher Rating Scale (TRS) constructed in Study 1, consisting of prototypical impulsive and reflective behaviour items, was sent to teachers. They were asked to rate their pupils using these items. The structure of the ratings was

analysed, and the dimensionality of impulsivity and reflectivity constructs was studied.

Method

Subjects

The TRS was filled in for a total of 270 pupils (122 male and 148 female) of the fifth form of Dutch primary schools. This was done by their own teacher ($N=17$). The teachers were recruited by telephone. All questionnaires were returned, sometimes after a repeated request.

Material and procedure

The TRS consisted of the 15-item Impulsivity scale and the 15-item Reflectivity scale constructed in Study 1. The 30 items were presented in random order. All ratings concern the frequency of pupils' behaviour. Items were rated, for each pupil separately, on a 6-point scale marked with global frequency terms ranging from 'never' to 'always'.

Result and discussion

The correlations among the items were analysed using Principal Components Analysis with Varimax Rotation. The results are presented in Table 4. A two-factor solution, indicated by the Scree criterion (Cattell, 1966), was forced. The two factors explained 47.1 and 14.7 per cent of the variance, respectively.

The factor solution replicated the original partition between the Impulsivity and Reflectivity items pool reasonably well. Considering only items that loaded more than |0.50| on one factor and less than |0.30| on the other factor, the first factor was represented by ten items from the Reflectivity item pool and only one item from the Impulsivity item pool that emphasized cognitive activity ('Starts working on a problem without analysing it first'). The second factor was represented by ten items from the Impulsivity item pool. From this it can be concluded that the Principal Component Analysis supports the results of Study 1 concerning the partition into a *cognitive* and a *social* component of impulsivity-related behaviour.

Seven items loaded substantially on both factors. As can be expected, the concepts are related to some extent. Two items did load less than 0.45 on both factors. For one item this was probably due to an unclear formulation. The other item, 'is spontaneous', was intended to measure impulsivity, but apparently touched a somewhat different concept.

Regarding further employment of the TRS, the two studies give a substantial base for maintaining separate scales for Reflectivity (Factor 1) and Social Impulsivity (Factor 2). That is to say, impulsivity and reflectivity, as perceived by teachers, are *not* two poles of one behavioural dimension. Following the above-mentioned criterion for item inclusion, the correlation between the scales was -0.41. The homogeneity index, Cronbach's alpha, was 0.95 for the Reflectivity scale and 0.92 for the Impulsivity scale.

In sum, impulsivity and reflectivity as viewed by teachers appear to be two different concepts. This is demonstrated by the results of factor and item analyses. *Impulsivity refers to hyperreactivity in mainly social contexts. Reflectivity refers to a good working attitude in a more cognitive context.*

Table 4.   Factor loadings of the Impulsivity and Reflectivity items on the factors for reflectivity and social impulsivity

Prototypical impulsive item (I) or prototypical reflective item (R)	Factor 1: Reflectivity	Factor 2: Social Impulsivity
Is inclined to react immediately when he/she sees something happen (I)		0.80
Is inclined to react immediately when he/she hears a sound (I)	−0.31	
Has difficulty awaiting his/her turn in a group discussion (I)	−0.13	
Is inclined to react immediately when something is told that is not intended for him/her (I)	−0.23	
Always reacts in a group discussion on what others say (I)	−0.11	0.72
Is spontaneous (I)	0.43	
Is inclined to react immediately after the slightest hearing of an explanation (I)	0.14	0.53
Is inclined to interfere when a teacher poses a question to another child (I)	−0.22	0.83
Wants to touch an object immediately he/she sees one (I)	−0.34	
Is inclined to take over another child's turn (I)	0.02	0.79
Has difficulty sitting still for a long time (I)	−0.50	0.65
Calls out in the classroom (I)	0.29	0.83
Reacts many times to class instructions first (I)	−0.08	0.76
Starts working on a problem without analysing it first (I)	−0.69	0.20
If it is a rule that children may not start on something before they have asked permission, he/she is not inclined to obey (I)	−0.23	0.57
Works in a well-considered way (R)	0.85	−0.18
Listens well when the teacher tells a story (R)	0.73	−0.29
Concentrates when listening to the teacher's instruction (R)	0.80	−0.40
Prepares well for a test (R)	0.83	−0.15
Listens to the explanation before turning to work (R)	0.77	−0.36
Is quiet (R)	0.45	−0.70
Works on a test with full effort (R)	0.82	−0.22
Works on tasks with concentration (R)	0.86	−0.29
Likes to produce good work (R)	0.83	−0.24
Is able to concentrate well on a test (R)	0.84	−0.19
Checks a test before handing it in (R)	0.70	−0.08
Works systematically when carrying out an order/task (R)	0.83	−0.15
Keeps to the rules of a group discussion (R)	0.46	−0.57
Asks for help during individual work only if strictly necessary (R)	0.43	−0.26
Is able to work on tasks independently (R)	0.84	−0.09

Note: All items are translated from Dutch.

GENERAL DISCUSSION

This investigation was designed to shed some light on the meaning that primary school teachers attach to the concept of *impulsivity* and its relation to the concept of *reflectivity*. The first study covered the construction of a questionnaire for measur-

ing impulsivity and reflectivity in the school situation, using the prototype method. In the second, factor analytic, study, the dimensionality of the concepts as made operational in Study 1 was established.

Behaviours that were rated as most prototypical for impulsivity in Study 1 can be best summarized as the tendency to react to all kinds of stimulus occurring in the classroom. An item like 'Reacting to something not meant for him/her' seems quite characteristic for impulsive behaviour as seen by the teachers. It is striking that although various kinds of distractors are mentioned by the teachers, most of them are social in nature. The school situation in which impulsivity seems to manifest itself most often is the group discussion. This is not surprising because the group discussion pre-eminently is a situation with a multitude of (social) stimuli to react to in a relatively unstructured environment. The finding of a socially manifested form of impulsivity in the classroom is not new. Previously, authors such as Milich and Kramer (1984) and Wels (1989) have noted the relevancy of discerning a social component of impulsivity. It can be argued that the concept described here is mainly a form of concentration difficulty. However, there seems to be an additional aspect. In most items a 'readiness to (re)act immediately' is implicated. This brings the concept near to the literal meaning of impulsivity, which is indeed 'acting on impulse'.

From the first study, it also appears that reflective behaviour, as conceived by teachers, can be best described as 'a good working attitude'. It refers to all kinds of behaviour that bring a task to a right end: listening to instruction, thorough preparation of tests, systematic work, concentration, checking work afterwards, willingness to achieve, and the ability to work independently. So, different from the *social* nature of impulsivity, reflectivity seems to be more *cognitive* in character. Reflective behaviours are most often seen in the more traditional school situations: during classical instruction, in a test situation, and when at work independently. Interestingly, these situations are also associated with psychological testing, as, for example, during MFFT administration.

As was stated in the Introduction, especially in the 'MFFT tradition' it is often assumed that impulsivity is the logical opposite of reflectivity. This opposition is not confirmed by the teachers, considering the more social content they mention of the concept of impulsivity and the cognitive character of the concept of reflectivity. In addition, the second study supports the idea of impulsivity and reflectivity having a separate, though not independent, status. The Principal Components Analysis shows two leading factors representing reflectivity (Factor 1) and impulsivity (Factor 2), instead of one factor representing both. So, apparently, teachers do not view impulsivity and reflectivity as opposites.

An argument that can be raised against this conclusion is that the two factors do not represent two different concepts but reflect two different situations in which impulsivity is manifested. However, the content of both factors is quite different. The reflectivity factor can be summarized as 'a good working attitude' and the impulsivity factor as 'a tendency to react to all stimuli in the classroom'. These descriptions show that it is not probable that these refer to the same behaviour in different contexts. Moreover, later studies (Visser, in preparation) showed that both concepts are associated with cognitive characteristics.

In the following, the correspondence between the concepts studied here and other impulsivity-related concepts will be addressed. Before turning to this issue, however, it seems relevant to remark that the present one was a study with only a restricted

scope. It focused on the concept of impulsivity and its relation to the concept of reflectivity, *as it exists in the mind of teachers*. An implication is that next to situation-aspecific behaviours, only behaviours in school-relevant situations are accounted for. Therefore, generalizations to a broader context must be interpreted cautiously.

An interesting question that arises, however, concerns the relationship of the two factors found in this study to impulsivity as defined by Kagan (Kagan, Pearson and Welch, 1966; Kagan *et al.*, 1964). Kagan's view of impulsivity as a cognitive style, characterized by fast and inaccurate responding in situations of response uncertainty, has the obvious component of action preparedness as seen in teachers' 'social impulsivity'. Some evidence for this is found in a study by Bjorkland and Butter (1973). They studied the relationship between various teacher ratings of impulsivity and children's MFFT performance. It appeared that only ratings of 'tendency to respond' were related to MFFT latency. On the other hand, unlike the present Social Impulsivity factor, MFFT performance has no reference to a social context. MFFT performance is measured in a test situation, which in the present study appeared typical for the manifestation of reflective behaviour. Obviously, to settle this issue further research is required.

Another question is to what extent are the factors found in the present teachers' ratings comparable to the general factors of impulsivity distinguished in personality research. In the Introduction it was stated that there are three main factors of impulsive behaviour: General Impulsivity, characterized by items such as 'Acting on the spur of the moment' and 'Taking quick decisions'; Venturesomeness and Non-planning; and Concentration Ability. When comparing the teachers' concepts of impulsivity and reflectivity with these factors, it becomes clear that the reflectivity component bears similarity to the factor of 'Concentration Ability'. However, reflectivity also carries some aspects of planning with it. The teachers' impulsivity component, characterized as hyperreactivity, is probably best represented by the General Impulsivity factor.

Making a small excursion beyond the subfactors of impulsivity to a more general taxonomy of personality descriptions, the Big Five (Goldberg, 1990), an interesting correspondence draws the attention. This correspondence regards the Reflectivity factor, found in this study, and the 'Big Five' factor of Conscientiousness. Conscientiousness is a factor representing qualities such as organization, efficiency, precision, persistence, punctuality, and logic (Goldberg, 1990). Relevant with regard to this study seems the quite persistent way that this factor appears when teacher ratings are in question (Kohnstamm, 1991). Although the Reflectivity factor is more restricted than the Conscientiousness factor, it seems clear that these factors have elements in common. In contrast, the quality 'impulsive' is part of the Extraversion factor of the 'Big Five' taxonomy (Goldberg, 1990). This again supports the view that these factors are not just the two ends of one dimension.

The present results have important implications for the diagnosis of impulsive behaviour. According to teachers, there is a considerable increase in the incidence of impulsive behaviour in the classroom (Das-Smaal *et al.*, 1987). In this respect it might be useful to distinguish between cognitive and social behaviour and their separate impact on scholastic achievement and class life. Probably the socially impulsive children will be the most obvious disturbers of class life, but it is not inconceivable that the unreflective children are most fallible regarding school performance. In addition, the situations in which social impulsivity and reflectivity most typically

occur are also informative. Regarding the assessment of reflectivity, it appeared that an experimental test situation is probably suitable. On the other hand, for 'social impulsivity', observations in a social interaction situation, such as the group discussion, are to be preferred.

The last part of this discussion concerns the use of the prototype method to investigate the teachers' ideas about impulsive and reflective behaviour and the usage of situations. The success of this method is largely dependent on the presence of observable behavioural manifestations of the concepts under investigation (Block, 1989). Apparently, both concepts were sufficiently and almost equally observable according to the teachers. For that, two factors might have been facilitative. The first factor is the addition of a situation specification to the commonly used general generation procedure. The number of descriptions generated in the situation-specific condition shows that this had a catalysing function. The second facilitating factor concerns the issue of how to define an act. Buss and Craik (1980) state that an act must be observable and countable in exact frequency terms. According to Block (1989), this could make the measurement more reliable. However, it probably also diminishes the validity of the instrument (Block, 1989). For all acts that were incorporated, in this study, global rather than exact frequency terms were used. Besides favourable for the validity, this global approach also has the advantage that it does not lay such a heavy burden on memory (Block, 1989).

In contrast to other research using the prototype method, in this study, the influence of the situation on behaviour was explicitly taken into account. This appeared to be especially informative as to what situation is most optimal for measuring the various aspects of impulsivity. One might conjecture that by specifying a situation, the risk is run that the frequency with which this situation is encountered, instead of the frequency with which the behaviour is exhibited given that specific situation, will determine the response. Indeed, this is a problem if situations are used that seldom occur. However, in this study situations that are all rather common at school were used. In this way, the specification of situations is a useful addition, contributing to construct validity.

Another departure from the original procedure described by Buss and Craik (1980) was the statistical check on the resulting item selection. This analysis (Study 2) confirmed the existence of the two concepts resulting from the prototype method (Study 1).

To summarize, from this study it appears that the concept of impulsivity as perceived by primary school teachers refers to a *social* phenomenon that cannot be considered the mere opposite of the *cognitive* oriented concept of reflectivity. Future research should be conducted to see if the social and cognitive components of impulsivity, as seen by teachers, have distinguishable concomitants.

ACKNOWLEDGEMENTS

Psychology, Neuro- and Developmental Psychology, and Special Education (Faculty of Psychology and Pedagogics, Vrije Universiteit Amsterdam, The Netherlands).

REFERENCES

Barratt, E. S. (1985a). 'Impulsiveness defined within a system model of personality'. In: Spielberger, C. D. and Butcher, J. N. (Eds), *Advances in Personality Assessment*, Vol. 5, pp. 113–132, Erlbaum, London.

Barratt, E. S. (1985b). 'Impulsiveness subtraits: arousal and information processing'. In: Spence, J. T. and Izard, C. E. (Eds), *Motivation, Emotion, and Personality*, pp. 137–146, Elsevier, North-Holland, Amsterdam.

Bjorklund, D. M. and Butter, E. J. (1973). 'Can cognitive impulsivity be predicted from classroom behaviour?', *Journal of Genetic Psychology*, **123**: 185–194.

Blackman, S. and Goldstein, K. M. (1982). 'Cognitive styles and learning disabilities', *Journal of Learning Disabilities*, **15**: 106–115.

Block, J. (1989). 'Critique of the act frequency approach to personality', *Journal of Personality and Social Psychology*, **56**: 234–245.

Block, J., Block, J. H. and Harrington, D. M. (1974). 'Some misgivings about the Matching Familiar Figures Test as a measure of reflection–impulsivity', *Developmental Psychology*, **10**: 611–632.

Borkenau, P. (1988). 'The multiple classification of acts and the big five factors of personality', *Journal of Research in Personality*, **22**: 337–352.

Broughton, R. (1984). 'A prototype strategy for construction of personality scales', *Journal of Personality and Social Psychology*, **47**: 1334–1346.

Broughton, R. (1990). 'The prototype concept in personality assessment', *Canadian Psychology*, **31**: 26–37.

Buss D. M. and Craik, K. H. (1980). 'The act frequency approach to personality', *Psychological Review*, **90**: 105–126.

Cantwell, D. P. (1988). 'DSM-III studies'. In: Rutter, M., Tume, A. H. and Lann, J. S. (Eds), *Assessment and Diagnosis in Child Psychopathology*, pp. 3–36, David Fulton Publishers, London.

Cattell, R. B. (1966). 'The meaning and strategic use of factor analysis'. In: Cattell, R. B. (Ed.), *Handbook of Multivariate Experimental Psychology*, pp. 174–243, Rand McNally, Chicago, IL.

Das-Smaal, E. A. (1989). *Attentional Problems at School: Overview of a Research Project*, Internal publication, Vrije Universiteit, Amsterdam.

Das-Smaal, E. A. (1990). 'Biases in categorization'. In: Caverni, J. P., Fabre, J. M. and Gonzalez, M. (Eds), *Cognitive Biases*, pp. 349–386, Elsevier, North-Holland, Amsterdam.

Das-Smaal, E. A., De Leeuw, L. and Orlebeke, J. F. (1987). 'Is er iets mis met de aandacht van het schoolkind?' [Is there something wrong with the attention of the school-child?], *Pedagogische Studiën*, **64**: 1–15.

De Jong, P. F. (1988). 'An application of the prototype scale construction strategy to the assessment of student motivation', *Journal of Personality*, **56**: 487–507.

Egeland, B. and Weinberg, R. A. (1976). 'The Matching Familiar Figures Test: a look at its psychometric credibility', *Child Development*, **47**: 483–491.

Eysenck, S. B. G., Pearson, P. R., Easting, G. and Allsop, J. F. (1985). 'Age norms for impulsiveness, venturesomeness and empathy in adults', *Personality and Individual Differences*, **6**: 613–619.

Fehr, B. and Russell, J. A. (1984). 'Concept of emotion viewed from a prototype perspective', *Journal of Experimental Psychology: General*, **113**: 464–486.

Gerbing, D. W., Ahadi, S. A. and Patton, J. H. (1987). 'Toward a conceptualization of impulsivity: components across the behavioural and self-report domains', *Multivariate Behavioural Research*, **22**: 357–379.

Goldberg, L. R. (1990). 'An alternative "description of personality": the big-five structure', *Journal of Personality and Social Psychology*, **59**: 1216–1229.

Grimm, K. H. and Meyer, W. U. (1976). 'Impulsivität–Reflexivität: ein korrekturbedürftiges Konzept' [Impulsivity–reflectivity: a faulty concept], *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, **78**: Whole No. 587.

Hopkins, J., Perlman, T., Hechtman, L. and Weiss, G. (1979). 'Cognitive style in adults originally diagnosed as hyperactives', *Journal of Child Psychology and Psychiatry*, **20**: 209–216.

Kagan, J., Pearson, L. and Welch, L. (1966). 'Conceptual impulsivity and inductive reasoning', *Child Development*, **37**: 583–594.

Kagan, J., Rosman, B. L., Day, D., Albert, J. and Phillips, W. (1964). 'Information processing in the child: significance of analytic and reflective attitudes', *Psychological Monographs*, **78**: Whole No. 578.

Kohnstamm, G. A. (1991). 'The roots of the big five: the case of conscientiousness', Paper presented at the 5th International Congress of the Individual Society for the Study of Individual Differences, Oxford.

Lakoff, G. (1986). *Women, Fire and Dangerous Things: What Categories Tell Us About the Nature of Thought*, University of Chicago Press, Chicago, IL.

Luengo, M. A., Carillo-de-la-Peña, M. T. and Otero, J. M. (1991). 'The components of impulsiveness: a comparison of the I.7 Impulsiveness questionnaire and the Barratt impulsiveness scale', *Personality and Individual Differences*, **12**: 657–667.

Magnusson, D. (1984). 'On the situational context in psychological research'. In: Lagerspetz, K. M. J. and Niemi, P. (Eds), *Psychology in the 1990's*, pp. 95–105, Elsevier, North-Holland, Amsterdam.

Messer, S. B. (1976). 'Reflection–impulsivity: a review', *Psychological Bulletin*, **83**: 1026–1052.

Milich, R. and Kramer, J. (1984). 'Reflections on impulsivity: an empirical investigation of impulsivity as a construct'. In: Gadow, K. (Ed.), *Advances in Learning and Behavioral Disabilities*, Vol. 3, pp. 57–94, JAI, Greenwich, CT.

Pick, A. D. (1983). 'Comments on Kinsbourne's chapter'. In: Perlmutter, M. (Ed.), *Development and Policy Concerning Children with Special Needs*, pp. 167–174, Erlbaum, Hillsdale, NJ.

Rosch, E. (1978). 'Principles of categorization'. In: Lloyd, B. B. (Ed.), *Cognition and Categorization*, pp. 27–48, Erlbaum, Hillsdale, NJ.

Rosch, E. and Mervis, C. B. (1975). 'Family resemblances: studies in the internal structure of categories', *Cognitive Psychology*, **7**: 573–605.

Salkind, N. J. and Wright, J. C. (1977). 'The development of reflection–impulsivity and cognitive efficiency', *Human Development*, **20**: 377–387.

Sergeant, J. A., Van Velthoven, R. and Virginia, A. (1979). 'Hyperactivity, impulsivity and reflectivity: an examination of their relationship and implications for clinical child psychology', *Journal of Child Psychology and Psychiatry*, **20**: 47–66.

Shrout, P. E. and Fleiss, J. L. (1979). 'Intraclass correlations: uses in assessing rater reliability', *Psychological Bulletin*, **86**: 420–428.

Sternberg, R. J. (1985). 'Implicit theories of intelligence, creativity, and wisdom', *Journal of Personality and Social Psychology*, **49**: 607–627.

Stunnenberg, Y. and Verwey, I. (1985). 'Sociale impulsiviteit, de ontwikkeling van een meetinstrument' [Social impulsivity, the development of a measuring device]. Unpublished report, Katholieke Universiteit, Nijmegen.

Tiedeman, J. (1983). 'Der kognitive Stil Impulsivität–Reflexivität: Eine kritische Bestand Aufnahme' [The cognitive style of Impulsivity–Reflectivity: a critical view], *Zeitschrift für Entwicklungspsychologische und Pädagogische Psychologie*, **15**: 66–74.

Van Heck, G. L. (1984). 'The construction of a general taxonomy of situations', In: Bonarius, H., Van Heck, G. L. and Smid, N. (Eds), *Personality Psychology in Europe: Theoretical and Empirical Developments*, Vol. 1, pp. 149–164, Swets & Zeitlinger, Lisse.

Van Heck, G. L. (1989). 'Situation concepts: definitions and classification'. In: Hettema, P. J. (Ed.), *Personality and Environment: Assessment of Human Adaption*, pp. 53–69, 241–259, Wiley, Chichester.

Visser, M. R. M. (1993) 'Cognitive characteristics of Impulsive Children', Doctoral dissertation, in preparation, Vrije Universiteit, Amsterdam.

Wagner, I. and Cimiotti, E. (1975). 'Impulsive und reflexive Kinder prüfen Hypothesen: Strate-

gien beim Problemlösen, aufgezeigt an Blickbewegungen' [Hypotheses testing by impulsive and reflective children, deduced from eye-movement measurements], *Zeitschrift für Entwicklungspsychologie*, **7**: 1–15.

Weiss, G. (1985). 'Hyperactivity: overview and new directions', *Psychiatric Clinics of North America*, **8**: 737–753.

Wels, P. A. (1989). 'Social impulsivity: development of an instrument for assessing social aspects of impulsivity', Poster and Hand-out presented at the International Symposium on AD–HD (Attention Deficit–Hyperactivity Disorder), Amsterdam.

Wright, J. C. and Vlietstra, A. G. (1975). 'The development of selective attention: from perceptual exploration to logical search'. In: Reese, H. W. (Ed.), *Advances in Child Development and Behavior*, Vol. 10, pp. 195–239, Academic Press, New York.

Zelniker, T. and Jeffrey, W. E. (1976). 'Reflective and impulsive children: strategies of information processing underlying differences in problem solving', *Monographs of the Society for Research in Child Development*, **41** (5, Serial No. 168).