



Interference in serial verbal reactions - ISVR (ESRC/10012/2011/AS)

Project Stage: Funded
 RCUK Research Councils: Economic and Social Research Council
 Lead organisation: Department of Psychology, University of York
 Project dates: 11 August 2011 to 10 August 2012
 Budget: £60,000.00

1 Introduction and Context

1.1 Basic Project Information

DCC 1.1.6: Other partner organisations

DCC 1.2: Short description of the project's fundamental aims and purpose

The difference in time for naming colors and reading color names has been variously explained. Cattell (1886) and Lund (1927) have attributed the difference to 'practice'. Woodworth and Wells (1911, p. 52) have suggested that, "The real mechanism here may very well be the mutual interference of the five names, all of which, from immediately preceding use, are 'on the tip of the tongue,' all are equally ready and likely to get in one another's way." Brown (1915, p. 51) concluded "that the difference in speed between color naming and word reading does not depend upon practice" but that (p. 34) "the association process in naming simple objects like colors is radically different from the association process in reading printed words."

The present problem grew out of experimental work in color naming and word reading conducted in Jesup Psychological Laboratory at George Peabody College For Teachers. The time for reading names of colors had been compared with the time for naming colors themselves. This suggested a comparison of the interfering effect of color stimuli upon reading names of colors (the two types of stimuli being presented simultaneously) with the interfering effect of word stimuli upon naming colors themselves. In other words, if the word 'red' is printed in blue ink how will the interference of the ink-color 'blue' upon reading the printed word 'red' compare with the interference of the [p. 647] printed word 'red' upon calling the name of the ink-color 'blue?' The increase in time for reacting to words caused by the presence of conflicting color stimuli is taken as the measure of the interference of color stimuli upon reading words. The increase in the time for reacting to colors caused by the presence of conflicting word stimuli is taken as the measure of the interference of word stimuli upon naming colors. A second problem grew out of the results of the first. The problem was, What effect would practice in reacting to the color stimuli in the presence of conflicting word stimuli have upon the reaction times in the two situations described in the first problem?

The proposed project will investigate five areas within interference in serial verbal reactions:

1. Interference in serial verbal reactions will be studied by means of newly devised experimental materials. This will test whether the source of the interference is in the materials themselves. The words red, blue, green, brown, and purple will be used on a test sheet. No word will be printed in the color it names but in an equal number of each of the other four colors; i.e. the word 'red' is printed in blue, green, brown, and purple inks; the word 'blue' is printed in red, green, brown, and purple inks; etc. Each word presents the name of one color printed in ink of another color. Hence, a word stimulus and a color stimulus both are presented simultaneously. The words of the test will be duplicated in black print and the colors of the test will be duplicated in squares or swastikas. The difference in the time for reading the words printed in colors and the same words printed in black is the measure of the interference of color stimuli upon reading words. The difference in the time for naming the colors in which the words are printed and the same colors printed in squares (or swastikas) is the measure of the interference of conflicting word stimuli upon naming colors.
2. The interference of conflicting color stimuli upon the time for reading 100 words (each word naming a color unlike the ink-color of its print) is predicted to cause an increase in response time over the normal time for reading the same words printed in black. These tests provide a unique basis (the interference value) for comparing the effectiveness of the two types of associations.
3. As a test of the permanency of the interference of conflicting word stimuli to naming colors eight days of practice (200 reactions per day) will be given in naming the colors of the print of words (each word naming a color unlike the ink-color of its print). The effects of this practice will then be assessed in terms of: (a) Decrease in interference of conflicting word stimuli to naming colors; (b) Production of a practice curve similar to that observed in other learning experiments; (c) An increase in variability; (d) Shorter reaction time to colors presented in color squares and; (e) Increased interference of conflicting color stimuli upon reading words.
4. Whether practice effects the variability of the group depending upon the nature of the material used.
5. If sex differences in naming colors is due to the difference in the training of the two sexes.

DCC 1.1.2: Funding body (or bodies)

ESRC

DCC 1.1.3: Budget

60,000.00 GBP

DCC 1.1.4: Duration

11 Aug 2011 to 10 Aug 2012

DCC 1.1.5: Lead partner organisation

Department of Psychology, University of York

1.2 Related Policies

DCC 1.3.1: Funding body requirements relating to the creation of a data management plan

We will adhere to the "ESRC Research Data Policy" guidelines relating to the responsibilities of grant applicants (September 2010) as laid out below. A full copy can be found in Annex X or at http://www.esrc.ac.uk/ESRCInfoCentre/Images/ESRC_Research_Data_Policy_2010_tcm6-37350.pdf

Responsibilities of ESRC grant applicants

Those ESRC grant applicants who plan to generate data are responsible for preparing and submitting data management and sharing plans for their research projects as an integral part of the application.

It is expected that an outline data management and sharing plan will include the following points:

- an explanation of the existing data sources that will be used by the research project with references;
- an analysis of the gaps identified between the currently available and required data for the research;
- information on the data that will be produced by the research project, including the following:

- o data volume

- o data type, e.g. qualitative or quantitative data

- o data quality, formats, standards documentation and metadata

- o methodologies for data collection

- planned quality assurance and back-up procedures [security/storage];
- plans for management and archiving of collected data;
- expected difficulties in data sharing, along with causes and possible measures to overcome these difficulties;
- explicit mention of consent, confidentiality, anonymisation and other ethical considerations;
- copyright and intellectual property ownership of the data; and
- responsibilities for data management and curation within research teams at all participating institutions.

The ESRC requires that all applicants seeking ESRC funding include a statement on data sharing in the relevant section of the Je-S application form. If data sharing is not possible, the applicant must present a strong argument to justify their case. The ESRC reserves the right to decline the request or demand additional information from the applicant.

Responsibilities of ESRC grant holders

It is a responsibility of the award holder to incorporate data management and sharing as an indivisible part of the research project to increase the potential for data to be shared. This should address potential issues of confidentiality, ethical issues, legal issues, time constraints and other issues which could limit data sharing opportunities from the very start of the project.

All ESRC funded research projects, collecting or producing data, are required to develop and implement a data management plan to ensure that data are well managed during their life-cycle and are ready to be offered for archiving and sharing when a project ends. Planning for data sharing should be done at the earliest stages of project design and well in advance of beginning fieldwork, particularly if it includes the collection and subsequent management of potentially confidential data that may affect data sharing. The award holder shall seek advice and guidance from the ESRC Economic and Social Data Service (ESDS) at the outset of the project to clarify how issues of confidentiality and sharing are to be addressed.

The award holder is expected to report on the on-going implementation of the data management and sharing plan through annual reporting to ESRC. In cases where there are ad hoc issues that may potentially have an impact on data sharing, the award holder must immediately raise these with the respective ESRC Case Officer so that further guidance and support can be provided.

It is the responsibility of the award holder to formally offer any data created or repurposed during the lifetime of the award to the ESDS within three months of the end of the award. The award holder is responsible for providing these data to the ESDS for assessment, and if accepted, to ensure that they meet the requirements of the ESDS for preservation and future re-use. If data were accepted, the award holder is expected to make them available to the ESDS for preparation for re-use and archiving without delay.

Sharing sensitive data – joint responsibilities

Most data generated as a result of economic and social research can be successfully archived and shared. The ESRC recognises that some research data are more sensitive than others and argues that it is a responsibility of the award holders to consider all issues related to confidentiality, security and copyright before initiating the research.

Where research data are considered confidential or contain sensitive personal data, award holders must seek to secure consent for data sharing or alternatively anonymise the data in order to make sharing possible. The ESRC regards a waiver of deposit as an exception and reserves the right to refuse waivers where there is insufficient evidence to prevent archiving and data sharing.

Where issues of confidentiality are foreseen that would prevent data being successfully shared, the award holder is encouraged to contact the ESDS at the earliest opportunity. The ESDS will provide all necessary support to the award holders, guiding them through various strategies to enable data sharing. The ESRC supports the position that sensitive and confidential data can be shared ethically provided researchers pay attention right from the planning stages of research to the following aspects:

- o when gaining informed consent, include consent for data sharing;

- o where needed, protect participants' identities by anonymising data; and
- o address access restrictions to data before commencing research in the data management and sharing plan

Only where researchers have demonstrated due diligence in all three areas will waivers be granted (<http://www.esds.ac.uk/aandp/create/dataman.asp>).

Intellectual Property Rights

The ESRC endorses the Research Councils position on the exploitation of research results and therefore positively encourages the exploitation of the results of research the ESRC support, as a contribution to enhance the quality of life, sustainability and competitiveness of the UK.

In respect of research grant funding, unless stated otherwise, the ownership of intellectual property and responsibility for its exploitation, rests with the organisation carrying out the research. The ESRC may, in specific cases, reserve the right to retain ownership of the intellectual property and to arrange for it to be exploited for the national benefit in other ways. If exercised, this condition is included in the terms of the relevant award. On the exploitation of research results and therefore positively encourages the exploitation of the results of research the ESRC support, as a contribution to enhance the quality of life, sustainability and competitiveness of the UK.

In taking responsibility for exploiting intellectual property, the ESRC expects the research organisation to ensure that individuals associated with the research understand the arrangements for exploitation. Where research is funded by or undertaken in collaboration with others, the research organisation is responsible for putting appropriate formal agreements in place covering the contributions and rights of the various organisations and individuals involved. Such agreements must be in place before the research begins. Research organisations are required to ensure that the terms of collaboration agreements do not conflict with the Terms and Conditions for Research Council Grants.

Copyright and Confidentiality

The ESRC expects award holders to meet the copyright requirements set down in the Copyright, Designs and Patents Act 1998. Responsibility for ensuring compliance with all laws and other legal instruments rests with the award holders and/or their institutions. The ESRC will not accept liability for any complaint or legal action taken against a researcher or the ESRC for infringements of copyrights, defamation or any other data protection requirements.

Security

The ESRC promotes and adheres to relevant levels of information security. The Council is committed to make all possible arrangements to ensure the protection of data from unauthorised use, change, disclosure or destruction.

The ESRC Secure Data Service has been established to promote excellence in research by enabling safe and secure remote academic access to data hitherto deemed too sensitive, detailed, confidential or potentially dispositive to be made available under standard licensing and dissemination arrangements. Data which can be anonymised without loss of significant informational content are not appropriate for the Secure Data Service.

Data Protection and Freedom of Information

The ESRC expects award holders to adhere to the Data Protection Act 1998, which contains eight (enforceable) principles of good practice, applying to anyone processing personal data, including the use of personal data in research. These include obtaining the data subject's consent or meeting at least one of the 'necessary' conditions described in the Act. The ESRC complies with the requirements of the Freedom of Information Act 2000 that establishes a general right of access to all types of recorded information held by public authorities, including Government Departments and Non-Departmental Public Bodies (http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/about/CI/freedom_of_information/FoI_Introduction.aspx).

If the Principal Investigator does not state to the contrary in the Je-S application form, it will be assumed that they are willing for their contact details and other relevant information to be shared with the relevant data service provider working with the ESRC (<http://www.esds.ac.uk/aandp/create/dataman.asp>).

Ethical considerations

The ESRC, in facilitating innovative and high quality research, requires that the research it supports will be carried out to a high ethical standard. ESRC award holders are, therefore, required to adhere to the key principles of ethical research addressed in the ESRC Framework for Research Ethics (http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/opportunities/research_ethics_framework/).

DCC 1.3.2: Institutional or research group guidelines

Department of Psychology, University of York: Data Storage and Archiving Policy

Introduction

The research councils require research data to be kept in a secure manner while in active use and also for the raw data be archived for a period of between five and twenty years on the completion of a project or submission of a paper. It is the responsibility of the institution at which the research was carried out to retain the archive data. This policy outlines the steps that must be taken to comply with these requirements and provides explanatory notes.

Policy

- o Active data must be stored in a secure fashion.
- o Active data must be backed up on a regular and frequent basis.
- o A backup copy of all data must be stored offsite on at least a weekly basis.
- o The Department will make available a suitable storage system and will be responsible for the backup of data stored on said system.
- o On submission of a paper, the raw data must be submitted to the Department for archiving.
- o The Department will securely store archived data for the required period of time and make it available as appropriate.
- o All Departmental/University administrative data must be stored on the fileserver.

Explanatory Notes

1. Data must be stored on a system that:

o is kept up to date with security patches and updates. All systems must be set to obtain anti-virus and operating system updates automatically. Systems for which this is not appropriate must either have a formal schedule defined for manual updates to be applied or not be connected to the network. Note that Microsoft do not provide updates for systems older than Windows 2000.

o requires a password to access. Data must not be stored on open shares (ones that can be accessed without a password), or on computers which do not require a password to access. The use of shared passwords is strongly discouraged due to the lack of accountability and should be avoided wherever possible.

o has redundancy built in to guard against data loss. Such redundancy must be designed to prevent against the failure of a single system (or component of a system) causing the loss of data.

It should be noted that data kept on physical media must also be kept in a secure fashion.

2. Any system holding research data must have an associated backup facility. This must back up onto either removable media or to a different system.

3. All data must have a backup copy stored off site at least once a week. This means that using a single external hard drive is insufficient unless the data is transferred onto another system off site. If a copy of data is kept on a live system offsite, this system should also meet the security and redundancy requirements set out in point 1 and must meet the password requirement.

4. With the purchase of the central storage array from Phase 1 of the IT Strategy, the Department can now offer secure, reliable storage with regular and offsite backup.

o The Department will provide 20GB storage per user.

o The Department will also offer an additional 20GB storage per research group. This can be used to share files between researchers working on a project or to transfer data from experimental systems to an individual researcher's filespace.

o Additional storage can be purchased at the cost of £10/GB for a 3 year period or £5/GB for a single year. This charge would cover:

o Provision of the purchased amount of storage.

o Setting security permissions to allow access either to an individual/lab group or named persons.

o Provision of instructions for mounting the storage from individual PCs or Macs.

o Daily/weekly/monthly backups.

o Recovery of deleted files (either from backup or shadow copies)

o This cost should be considered against the cost of:

o Purchase of additional secure storage.

o Ongoing time requirements of synchronisation of files between local systems and this storage.

o (At least) Weekly transfer of this data off site.

o Ongoing maintenance of security on local systems.

5. On submission of a paper, all relevant data must be submitted to the Department. This should include:

o Information about the paper (title, journal, authors...).

o The raw data.

o An index to the data files if required (such as a mapping between data files and participants).

o A description of the structure of the data files.

o If required, a key to the meaning of triggers of experimental conditions within the data file.

o Stimuli.

o Optionally, any additional information (such as processed data, figures or a copy of the paper).

6. All of the information detailed in point 5 will be archived into an individual Zip file and stored on two copies of archive media along with checksum information. These will be stored in different locations. On an annual basis, the media will be checked for consistency.

The Department will trial a system over the coming months to ensure that all relevant data is stored. An online database will be constructed to allow external users to find and request the data. When this is complete, the URL will be disseminated to allow researchers to publish it along with papers.

7. All Departmental administrative files (support staff files, tutorial data, examination papers/results...) must be stored on the Departmental file server in an area with security permissions appropriate to the data.

DCC 1.3.3: Other policy-related dependencies

Data Protection

The Studies of interference in serial verbal reactions project will adhere to the eight data protection principles that govern the use of personal information as described in the Data Protection Act 1998. Any personal information held by the project will be:

o processed fairly and lawfully

o processed for one or more specified and lawful purposes, and not further processed in any way that is incompatible with the original purpose

o adequate, relevant and not excessive

o accurate and, where necessary, kept up to date

o kept for no longer than is necessary for the purpose for which it is being used

o processed in line with the rights of individuals

o kept secure with appropriate technical and organisational measures taken to protect the information

o not transferred outside the European Economic Area (the European Union member states plus Norway, Iceland and Liechtenstein) unless there is adequate protection for the personal information being transferred

The institutions registration and notification of its uses of personal data can be viewed as part of the Public Register of Data Controllers maintained by the Information Commissioner's Office (http://www.ico.gov.uk/what_we_cover/promoting_data_privacy/keeping_the_register.aspx). The University's registration number is Z4855807. Contact the Records Management office for further information (<http://www.york.ac.uk/recordsmanagement/>).

Freedom of Information

The Studies of interference in serial verbal reactions project will comply with the Freedom of Information Act 2000 and will handle any requests within a timely manner as described in the following document and represented graphically below:

<http://www.york.ac.uk/recordsmanagement/foi/enquiryguide.htm>

1.3 Basic Data Management Plan Information

DCC 1.4.1: Date of creation of this plan

01/10/2010

DCC 1.4.2: Aims and purpose of this plan

The purpose of this plan is to specify the following in relation to the Studies of interference in serial verbal reactions project:

- o Data collection policies
- o Data standards
- o Data quality and quality assurance
- o Short and long term data storage
- o Policies on access to data
- o Intellectual Property considerations
- o Data dissemination and sharing

DCC 1.4.3: Target audience for this plan

The target audience for this Data Management Plan comprises:

- o The funding body ESRC
 - o The project manager/principle investigator and/or person responsible for data management
 - o The Records Management Office at the University of York who are the named lead institution (<http://www.york.ac.uk/recordsmanagement/>)
- Any other interested parties

2 Data Types, Formats, Standards and Capture Methods

DCC 2.1: Give a short overview description of the data being generated or reused in this research

The data generated by this scientific experiment will mainly be numerical reaction times recorded over a number of trials and sessions per participant. Numerical error rates will be recorded. Biodata such as gender, age etc. will also be recorded. It is anticipated that raw data will be in the order of 20Mb per participant over the length of the project and that there will be approximately 100 participants. In total it is estimated that this will generate a final dataset of around 2Gb.

2.1 Existing Data

DCC 2.2.1: Have you reviewed existing data, in your own institution and from third parties, to confirm that new data creation is necessary?

Yes

DCC 2.2.3: Describe any access issues pertaining to the pertinent, existing data

None

DCC 2.2.2: What existing datasets could you use or build upon?

We have examined the datasets produced by authors such as Lund (1927) and Ligon (1932) which tested a similar hypothesis to our own but with a younger age range of subjects.

2.2 New Data

DCC 2.3.1: Why do you need to capture/create new data?

The materials employed in these experiments are quite different from any that have been used to study interference. In former studies the subjects were given practice in responding to a set of stimuli until associative bonds were formed between the stimuli and the desired responses, then a change was made in the experimental 'set up' which demanded a different set of responses to the same set of stimuli. In the present study pairs of conflicting stimuli, both being inherent aspects of the same symbols, are presented simultaneously (a name of one color printed in the ink of another color -- a word stimulus and a color stimulus). These stimuli are varied in such a manner as to maintain the potency of their interference effect. In addition we intend to test a cohort of adults as compared with previous studies in the area which worked with children and young adolescents.

Employing new materials and paradigm necessitates that new data are captured from participants.

DCC 2.3.2: Describe the process by which you will capture/create new data

Participants will take part in a series of experiments in which they will be presented with various coloured words on a

computer screen. These words will be presented using E-Prime. Each participant will automatically be assigned a unique number by the E-Prime software for each experiment they participate in. After each experiment data will be stored in a file where the participant number forms the filename and the extension will be ".dat".

Collected data will be combined and analysed using E-Prime E-DataAid which generates ".edat" files. Further analysis will be carried out using SPSS which generates ".sav" files when storing data and ".spv" or ".spo" files when storing the output of statistical tests.

Files will be stored under a meaningful folder structure representing the experiment carried out and each file will have a relevant file name.

DCC 2.3.3: Which file formats will you use, and why?

During the course of the research we envisage that the following file formats will be used:

File format Software used Reason for use

*.docx Microsoft Word (<http://office.microsoft.com/en-gb/>)

Standard file format of Microsoft Word which is the word processor application provided by default by my host institution

*.xlsx Microsoft Excel

(<http://office.microsoft.com/en-gb/>)

Standard file format of Microsoft Excel which is the spreadsheet application provided by default by my host institution

*.sav IBM SPSS

(<http://www.spss.com/>)

Standard file format of SPSS which is the statistical analysis application provided by default by my host institution

*.spo & spv IBM SPSS

(<http://www.spss.com/>)

Standard file format of SPSS which is the statistical analysis application provided by default by my host institution

*.es E-Prime

(<http://www.pstnet.com/>)

Script file that E-Prime generates when designing an experiment

*.edat E-Prime

(<http://www.pstnet.com/>)

Data file that E-Prime generates when saving a participants responses to trials in an experiment

*.txt Raw text file A raw text version of any word processed documents to aid in preservation and open access

*.csv Comma Separated Value file A raw text version of data files

*.pdf Adobe Acrobat

(<http://www.adobe.com/>)

A portable document format version of all files will be produced to aid in preservation and open access

DCC 2.3.4: What criteria and/or procedures will you use for Quality Assurance/Management?

As a matter of course equipment used to collect timing critical data will be calibrated using a Black Box ToolKit (<http://www.blackboxtoolkit.co.uk/>) to ensure that data collected is valid, reliable and accurate. All experimental paradigms will be administered through E-Prime which ensures that data will be collected and stored in a consistent format. Data analysis will be carried out using E-DataAid, Excel and SPSS. Where possible metadata will be saved along side raw data files, e.g. from the SPSS data dictionary.

Data generated, and any subsequent analyses, will be internally peer reviewed by members of the project team as appropriate. Any data subsequently published will be subject to wider peer review.

2.3 Relationship between old and new data

DCC 2.4.2: How will you manage integration between the data being gathered in the project and pre-existing data sources?

There is no relationship between existing data and the proposed study by virtue of the use of novel materials and new procedure as outlined in 2.3.1.

DCC 2.4.3: What added value will the new data provide to existing datasets?

There is no relationship between existing data and the proposed study by virtue of the use of novel materials and new procedure as outlined in 2.3.1.

DCC 2.4.1: What is the relationship between the new dataset(s) and existing data?

There is no relationship between existing data and the proposed study by virtue of the use of novel materials and new procedure as outlined in 2.3.1.

2.4 Data Documentation and Metadata

DCC 2.5.3: How will you create or capture these metadata?

Datasets stored in SPSS will be fully described using meaningful long variable names together with entries in the data dictionary. An XML file will be generated automatically from these in order to intrinsically describe the dataset. Additional extrinsic, or contextual, information about the dataset will be stored in either text files and/or Excel spreadsheets. This extrinsic information will be generated by the principal investigator.

DCC 2.5.4: What form will the metadata take?

Descriptive metadata will be created using the Dublin Core standard (ISO 15836:2009) which will allow other researchers and automated tools, such as search engines, to discover and catalogue the dataset according to recognised standards. Dublin Core metadata will be stored as XML 1.0 records as appropriate.

Extrinsic descriptive metadata will be created in XML 1.0. This will narratively describe the dataset and its features to enable reuse and repurposing by others. The structure of this metadata will be appropriate to the project and the judgement of the principal investigator.

Intrinsic technical metadata will be automatically generated in XML 1.0 from the SPSS data dictionary in order to describe the datasets attributes. The structure for this metadata will be constrained by the support offered in the current release of SPSS.

DCC 2.5.5: Why have you chosen particular standards and approaches for metadata and contextual documentation?

Dublin Core (ISO 15836:2009) was chosen as the descriptive metadata format of choice as it is a widely adopted format and simple to implement in XML 1.0. XML 1.0 documents will be used to store all metadata as it is a widely adopted format, simple to implement, cross platform and machine readable. Contextual information will be stored in XML 1.0 format documents as a result. Intrinsic metadata will also be stored in this format as SPSS can automatically output XML 1.0 from data files data dictionaries. Where appropriate supporting text and/or Excel files will provide a narrative explanation of the dataset and its contents. The data itself will be stored in its native format alongside a simpler mirror format, e.g. SPSS *.sav files and Comma Separated Value (CSV) files.

DCC 2.5.1: Are the datasets which you will be capturing/creating self-explanatory, or understandable in isolation?

No

DCC 2.5.2: If you answered No to DCC 2.5.1, what contextual details are needed to make the data you capture or collect meaningful?

Datasets stored in SPSS will be fully described using meaningful long variable names together with entries in the data dictionary. Additional extrinsic, or contextual, information about the dataset will be stored in either text files and/or Excel spreadsheets. For example, each SPSS data file will have an accompanying text file that will describe the dataset, variables, variable scope etc. together with annotated examples to aid clarity.

3 Ethics and Intellectual Property

3.1 Ethical and Privacy Issues

DCC 3.1.3: Is the data that you will be capturing/creating "personal data" in terms of the Data Protection Act (1998) or equivalent legislation if outside the UK?

No, as all data will be anonymised and at no stage will any identifying personal data be held.

DCC 3.1.4: What action will you take to comply with your obligation under the Data Protection Act (1998) or equivalent legislation if outside the UK?

The project will comply with its obligations under the Data Protection Act 1998 by following the eight principles outlined below:

1. Fairly and lawfully processed, in particular in accordance with certain conditions in the Act
2. Obtained only for one or more specified and lawful purposes, and shall not be further processed in any manner incompatible with that purpose or those purposes
3. Adequate, relevant and not excessive in relation to the purpose or purposes for which they are processed
4. Accurate and, where necessary, kept up to date
5. Not kept longer than necessary for the purpose or purposes they are processed for
6. Processed in accordance with the individual's rights under the DPA
7. Kept secure by the taking of appropriate technical and organisational measures against unauthorised or unlawful processing and accidental loss, destruction or damage
8. Not transferred to countries outside the European Economic Area, unless there is adequate protection

DCC 3.1.1: Are there ethical and privacy issues that may prohibit sharing some or all of the dataset(s)?

Yes

DCC 3.1.2: If you answered Yes to DCC 3.1.1, How will these be resolved?

Any datasets that contain personally identifiable information will be anonymised according to standard best practice. As E-Prime is being used to administer all experimental paradigms we don't envisage a large volume of anonymisation will be necessary as participants data is automatically anonymised and output file names sequentially numbered rather than use any personal biographical data or experimental condition information.

3.2 Intellectual Property Rights

DCC 3.2.3: If you answered Yes to DCC 3.2.1, How will the dataset be licensed?

Any datasets and other project output will be licensed under the Creative Commons "Attribution Non-Commercial Share Alike" (cc by-nc-sa) agreement.

DCC 3.2.4: For multi-partner projects, what is the dispute resolution process / mechanism for mediation?

Any licensing disputes will be passed onto the relevant body depending on the nature of the dispute and where it occurs in the lifecycle of the project. This could be any or all of the following, the Research Support Office at The University of York, ESRC, and UK Data archive. Each body has a defined dispute resolution process and mechanisms for mediation.

DCC 3.2.1: Will the dataset(s) be covered by copyright or the Database Right? If so give details in DCC 3.2.2, below.

Yes

DCC 3.2.2: If you answered Yes to DCC 3.2.1, Who owns the copyright and other Intellectual Property?

Copyright will be shared between the host institution (The University of York) and ESRC.

4 Access, Data Sharing and Reuse

4.1 Access and Data Sharing

DCC 4.1.1: Are you under obligation or do you have plans to share all or part of the data you create/capture?

Yes

DCC 4.1.2: If you answered No to DCC 4.1.1, why will you not share your data?

n/a

DCC 4.1.3: If you answered Yes to DCC 4.1.1, How will you make the data available?

As a requirement of funding all datasets will be deposited in The UK Data Archive as outlined in the ESRC funding guidelines. Data will be made available through The UK Data Archive standard operating procedures.

DCC 4.1.4: If you answered Yes to DCC 4.1.1, When will you make the data available?

Data will be made available at the end of the project.

DCC 4.1.5: If you answered Yes to DCC 4.1.1, What is the process for gaining access to the data?

Data will be deposited with The Data Archive on completion of the project. In order to access data prospective users will need to contact The UK Data Archive (<http://www.data-archive.ac.uk>) and follow standard operating procedures.

DCC 4.1.6: If you answered Yes to DCC 4.1.1, Will access be chargeable?

Yes

DCC 4.1.7: If you answered Yes to DCC 4.1.6, Please give details.

The Data Archive currently charge a nominal fee for access to certain types of dataset. For current details of pricing you should consult The UK Data Archive.

4.2 Exploitation

DCC 4.2.1: Does the original data collector/ creator/ principal investigator retain the right to use the data before opening it up to wider use?

Yes

DCC 4.2.2: If you answered Yes to DCC 4.2.1, Please give details.

Standard terms of ESRC grant funding allows researchers exclusive access to data they generate during a projects lifetime and for a further period of six months after the completion date.

DCC 4.2.3: Are there any embargo periods for political/commercial/patent reasons?

No

DCC 4.2.4: If you answered Yes to DCC 4.2.3, Please give details.

N/A

4.3 Reuse

DCC 4.3.1: Which groups or organisations are likely to be interested in the data that you will create/capture?

Researchers interested in cognitive psychology and specifically perception.

DCC 4.3.2: How do you anticipate your new data being reused?

It is possible that others may want to reuse this project's data in order to generate new hypotheses to explain current findings or as a basis to construct new theories and areas of research. Alternatively they may be used for instruction within a teaching context.

5 Short-Term Storage and Data Management

5.1 Storage Media and Data Transfer

DCC 5.1.1: Where (physically) will you store the data during the project's lifetime?

Data will physically be held on desktop PCs hard drives. The desktop PC will be located in a secure location in the named institutions relevant departments.

Over the course of the study we anticipate a dataset of 500Mb of data will be generated each month on average.

DCC 5.1.3: How will you transfer/transmit the data, if this is required?

If required, data will be transferred between sites using Virtual Private Networks (VPNs) encrypted to recognised standards as implemented at each institution by central services.

DCC 5.1.2: What media will you use for primary storage during the project's lifetime?

The primary data storage media during the project's lifetime is likely to be a hard disk drive which is located within the departments secure files server.

5.2 Back-Up

DCC 5.2.2: How regularly will back-ups be made?

Global institutional and departmental level backup mechanisms and policies exist which determine the regularity of backups according to best practice. Additionally data will be backed-up to an external hard drive on a nightly basis. A second encrypted external hard drive will be taken off-site at the end of each month and stored in a secure location.

DCC 5.2.3: Who is responsible for backup?

IT Manager, Department of Psychology, University of York, York, UK

DCC 5.2.1: How will you back-up the data during the project's lifetime?

Global institutional and departmental level backup mechanisms and policies exist which cover the project during its lifetime. Additionally data will be backed-up to an external hard drive. A second encrypted external hard drive will be taken off-site and stored in a secure location.

5.3 Security

DCC 5.3.2: How will you implement permissions, restrictions and/or embargoes?

Access to data and files stored on the departmental fileserver will be restricted by staff seniority and maintained through Active Directory and local Windows security.

DCC 5.3.1: How will you manage access restrictions and data security during the project's lifetime?

Global institutional and departmental password mechanisms and policies exist which determine the strength of and frequency of changes according to best practice. Data held on local and networked storage will be encrypted based on these credentials.

Data that is not subject to the Data Protection Act 1998 may be transmitted over unsecured networks where an encrypted alternative does not exist.

DCC 5.3.3: Give details of any other security issues.

No data will be taken off-site apart from the monthly hard drive based backup which will be encrypted and ultimately stored in a secure location.

6 Deposit and Long-Term Preservation

DCC 6.1: What is the long-term strategy for maintaining, curating and archiving the data?

On completion, project data will be deposited with The UK Data Archive as a requirement of ESRC funding. The UK Data Archive acquire, curate and provide access to the UK's largest collection of social and economic data.

6.1 Long-Term Specifics

DCC 6.2.1: Will or should data be kept beyond the life of the project?

Yes

DCC 6.2.2: If you answered Yes to DCC 6.2.1, How long will or should data be kept beyond the life of the project?

All data, as a funding requirement, will be deposited with The UK Data Archive. Data deposited with The Data Archive will be stored for the number of years outlined in their data storage policy (<http://www.data-archive.ac.uk>).

DCC 6.2.4: What data will be preserved for the long-term?

All data produced as a direct result of the project will be preserved along with any data derived from that data.

DCC 6.2.5: On what basis will data be selected for long-term preservation?

Does not apply as all data will be preserved.

DCC 6.2.6: If the dataset includes sensitive data, how will you manage this over the longer term?

The dataset includes no sensitive data that needs to be managed over the long term.

DCC 6.2.7: Will transformations be necessary to prepare data for preservation and/or data sharing?

Yes

DCC 6.2.8: If you answered Yes to DCC 6.2.7, what transformations will be necessary to prepare data for preservation / future re-use?

All data will be anonymised to remove any personally identifiable information before it is deposited with The UK Data Archive and shared with the wider community as is a requirement of ESRC funding.

DCC 6.2.3: If you answered Yes to DCC 6.2.1, What data centre/ repository/ archive have you identified as the long-term place of deposit?

All data, as a funding requirement, will be deposited with The UK Data Archive.

6.2 Metadata and Documentation for Long-Term Preservation

DCC 6.3.1: What metadata/ documentation will be submitted alongside the datasets or created on deposit/ transformation in order to make the data reusable?

Contextualising information such as the original bid, research reports and publications will be stored alongside the

projects data outputs. Metadata will be constructed to describe the actual data itself together with relevant administrative information to aid in resource discovery. If any manipulations have been carried out these will be described in suitable depth.

DCC 6.3.2: How will this metadata/documentation be created, and by whom?

Metadata and supporting documentation will be created by the Principal Investigator under the guidance of The UK Data Archive.

DCC 6.3.3: Will you include links to published materials and/or outcomes?

Yes

DCC 6.3.4: If you answered Yes to DCC 6.3.3, please give details.

Web links to the main project website will be provided in order to allow access to contextual information, reports, research papers and other outputs. Where project outputs are hosted by third parties, such as journal publishers, direct links will be provided.

DCC 6.3.5: How will you address the issue of persistent citation?

Persistent citations will be used for both project documents (DOIs through CrossRef) and web resources (PURLs through purl.org) in order to help ensure persistence both during the project and once it has ended.

6.3 Longer-Term Stewardship

DCC 6.4.1: Who will have responsibility over time for decisions about the data once the original personnel have gone?

As data and other project outputs will be deposited with The UK Data Archive as a requirement of funding it is anticipated that they will be responsible for longer term stewardship.

DCC 6.4.2: In the event of the long-term place of deposit closing, what is the formal process for transferring responsibility for the data?

In the event of The UK Data archive closing the responsibility for transfer of data and other materials is devolved to them.

7 Resourcing

DCC 7.2: How will data management activities be funded during the project's lifetime?

Departmental and institutional shared fileservers space and backup will be funded through host institution overheads included within project funding. The Principal investigator (J. Ridley Stroop) and Research Assistants data management activities will be funded as a fraction of the funding made available.

DCC 7.3: How will longer-term data management activities be funded after the project ends?

Data and other project outputs will be deposited with The UK Data Archive as a requirement of funding. Costs for long term data management will be met by ESRC and The UK Data Archive.

DCC 7.1: Outline the staff/organisational roles and responsibilities for data management

Role	Responsibility	Time allocation
Daily backup of data	Host department	As required
Daily local backup of data	Principal investigator (J. Ridley Stroop)	As required
Monthly backup of data (offsite)	Principal investigator (J. Ridley Stroop)	As required
Physical security of computer hardware	Host department	As required
Creation of metadata	Principal investigator (J. Ridley Stroop)	1 hour per week (est)
Creation of supporting contextualising documentation	Principal investigator (J. Ridley Stroop)	1 hour per week (est)
Cleaning of data to meet Data Protection Act 1998 requirement, e.g. anonymising data	Research Assistant (TBA)	1 hour per week (est)
Transposition of data into suitable format for deposit into repository	Research Assistant (TBA)	1 hour per week (est)
Deposit into The UK Data Archive at end of project	Principal investigator (J. Ridley Stroop)	As required

8 Adherence and Review

8.1 Adherence

DCC 8.1.1: How will adherence to this data management plan be checked or demonstrated?

Adherence to this data management plan will be demonstrated by checking that tasks outlined have been carried out no later than two weeks after a sub-study, or set of experiments, has ended. For example, descriptive and other metadata should be constructed within two weeks. Backups will be checked on an ongoing basis to ensure they have taken place and are recoverable as part of a data recovery plan. At the end of the project deposit into The UK Data Archive will demonstrate adherence to planned exit strategy and long term preservation. Short internal reviews will be carried out on a monthly basis.

DCC 8.1.2: Who will check this adherence?

The Principal Investigator (J Ridley Stroop).

8.2 Review

DCC 8.2.1: When will this data management plan be reviewed?

Data management plans will be reviewed on a rolling six month schedule.

DCC 8.2.2: Who will carry out reviews?

The Principal Investigator (J Ridley Stroop).

DCC 8.2.3: Does this version of the DMP supersede an earlier plan?

No

DCC 8.2.4: If you answered Yes to DCC 8.2.3, you may wish to enter information about the relationship between versions here.

N/A

9 Statement of Agreement**DCC 9.1: Statement of Agreement**

All parties agree to carry out data management in accordance with the project's data management plan.

10 Annexes and other issues**DCC 10.1: Contact details and expertise of nominated data managers / named individuals**

IT Manager, Department of Psychology, University of York, York, UK (Data Backup, Disaster Recovery & Network Provision)

J. Ridley Stroop, Principal Investigator, Department of Psychology, University of York, York, UK (Contextualising Documentation & Metadata Creation)

A Research Assistant, Department of Psychology, University of York, York, UK (Data Transformations)

DCC 10.2: Glossary of terms

E-Prime: Software used to construct psychology experiments, present stimuli and collect data from participants

E-DataAid: Software used to analyse data collected by E-Prime

DCC 10.3: Other annexes as required

Signature _____

Date _____

Print name _____

Role/institution _____

Signature _____

Date _____

Print name _____

Role/institution _____

Signature _____

Date _____

Print name _____

Role/institution _____