The Relationship Between Perceived Career Benefit and Data Sharing and Reusing

Behaviour Moderated by Career Stage Among Traumatic Stress Researchers

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June 26, 2022

Abstract

Background. Previous studies identified underlying factors for the data sharing and reusing behaviour of scientists among diverse specializations. However, prior findings may not be generalized to the traumatic stress field. This research has investigated the data sharing and reusing behaviour of scientists within the traumatic stress field by testing the relationship between the perceived career benefit and data sharing and reusing behaviour. Furthermore, two career stages were compared and it was tested if the researchers' career stage moderated the predicted relationships between perceived career benefit, data sharing and reusing behaviour.

Method. This study used a cross-sectional online questionnaire to assess the perceived career benefit, data sharing and reusing behaviour of researchers within the traumatic stress field. By using a purposive sampling method, 218 participants were recruited. The previously predicted relationships were analysed by using linear regression analysis, while the Kruskal Wallis test was used to assess career stage differences. Additionally, moderation analysis was conducted by using the SPSS package "PROCESS" by Andrew F. Hayes.

Results. No significant relationship between perceived career benefit and data sharing nor between perceived career benefit and data reusing was found. Furthermore, significant differences between junior and senior career stage researcher were found in the participants' data sharing and reusing scores, while no significant difference was found in the researchers' perceived career benefit scores. Moreover, no moderation effect was found on the previously mentioned relationships.

Discussion. This study suggested that the data sharing and reusing behaviour is not common practice within the traumatic stress field. Furthermore, this study suggested that future research is needed to clarify the relationship between perceived career benefit and data sharing or reusing behaviour within the traumatic stress field.

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The innovation of the internet had an enormous impact on the practices of conducting research. Today's research is in a constant state of development and researchers all over the world find themselves in a global network of scientific journals and forums that are provided and accessible on the web. Crucial for the changes in conducting research is the sharing and reusing of data. Data sharing primarily relates to providing access for the reuse as well as the preservation and disposition of data (Tenopir et al., 2012), while data reuse is associated with the use of data that was collected by other researchers (Kim, 2013). Over the last decade, data sharing and reusing has gained attention from several research communities and scientific journals, since it has the potential to facilitate the efficiency of the research cycle by minimizing the required new data for other researchers (Kassam-Adams & Olff, 2020; Kim & Stanton, 2014; Kim & Yoon, 2017; Tenopir et al., 2012).

Particularly for research areas dealing with small sample sizes, data sharing, as well as data reusing, could be of extreme value. This includes the field of traumatic stress research, especially, the study of PTSD. By pooling the data, the study of PTSD could work with bigger sample sizes, which can improve the research on intervention effectiveness and the analysis of trauma-related cognition and symptoms (Kassam-Adams & Olff, 2020). Furthermore, since participants in the PTSD field often made traumatic experiences such as sexual assault and violence, the confrontation with the traumatic experience during research interviews can negatively impact the participant's well-being by causing distress and psychological burden (Van der Kolk, 2022; Van der Velden et al., 2013). By sharing and reusing the data of people who are at risk, research could be conducted with a minimised risk of burdening participants.

However, even though data sharing does offer a lot of opportunities and benefits, it is still not the norm in the field of traumatic stress research. Within the field of psychology and psychiatry, Hardwicke and Ioannidis (2018) investigated the availability of data from 111 highly cited articles. They reported that most data sets were not available at all (76/111), some data sets were only limitedly available (20/111), and only a few had no restrictions (15/111) (Hardwicke & Ioannidis, 2018). Similar findings were reported by Sherry and colleagues (2020), who examined 211 randomly selected publications based on their data accessibility, transparency, and reproducibility within the psychiatric literature. Within their study, they found that only 14

publications had a material availability statement, while only one of these 14 publications actually provided accessible raw data documents for reproducibility reasons (Sherry et al., 2020). According to the previously mentioned findings, data sharing is still not common practice within the traumatic stress field which is highlighting the need to investigate why not all scientists share data equally. Previous researchers investigated scientists' data sharing behaviour across diverse disciplines and discovered multiple barriers and factors including institutional barriers, disciplinary norms, lack of technological infrastructure, and individual factors that influence scientists' data sharing and reusing behaviour (Kassam-Adams & Olff, 2020; Kim & Stanton, 2015; Kim & Yoon, 2017).

Perceived Career Benefit and Data Sharing

Referring to the previously mentioned individual factors related to data sharing behaviours, a positive relationship between perceived career benefits and data sharing behaviour was found (Bordia et al., 2004; Kim, 2013; Kim & Adler, 2015; Kim & Stanton, 2015; Kim & Zhang, 2015; Van den Eynden, 2018). Perceived career benefit can be defined as the degree to which scientists believe that their data sharing behaviour has a positive effect on their career in terms of citations, recognition, reputation, acknowledgements, or authorships (Kim, 2013; Kim & Stanton, 2015). This means that if researchers perceive high career benefits due to their data sharing behaviour, they are more likely to engage in data sharing behaviour. On the other hand, if researchers perceive small or no rewards, they are less likely to engage in data sharing behaviour (Kim, 2013; Kim & Stanton, 2015). However, even though prior research examined the association between perceived career benefit and data sharing behaviour across various disciplines, until now, it is unclear whether these findings can be generalized to the field of traumatic stress. Therefore, this research will examine this association among traumatic stress researchers.

Perceived Career Benefit and Data Reuse

So far prior research has focused primarily on the association between perceived career benefit and data-sharing, but not on data re-using. Some research has been done on the association between data reuse and constructs related to perceived career benefits. For instance, Kim and Yoon (2017) mentioned perceived usefulness, which relationship was found to be significant with data reusing behaviour. However, perceived usefulness is associated with increased productivity and effectiveness and does not cover perceived career benefit by its

definition (Kim & Yoon, 2017). Curty and Qin (2015) identified perceived benefit, which is closely related to the definition of perceived career benefit, as one of their core variables that contributes to researchers' data reusing intentions. However, they only identified perceived benefit to be consistent across interviews but did not analyse the relationship between perceived benefit and data reusing behaviour. As an indication that supports this suggestion of a relationship, Piwowar and Vision (2013) found a citation benefit for papers that reused data from previous research, indicating that reusing data is associated with greater recognition and reputation. According to Kim (2013), this would suggest a higher perceived career benefit because researcher perceive an increased reputation and recognition as positive and valuable for their career. Thus, even though prior research did find indications for an association between perceived career benefit and data reusing behaviour, the association was not investigated sufficiently. Therefore, this research tries to examine the association between perceived career benefit and data reusing behaviour within the traumatic stress field.

Researchers' Career Stage

According to van den Eynden (2018), gaining citations and credit from data sharing is significantly more important for researchers in the early career stage, while Campbell and colleagues (2019) stated that senior researchers perceived less benefit from data sharing and thus are less likely to engage in data sharing. However, contradicting this assumption are the findings from Zhu (2019), who found that senior career stage researchers have more experience in sharing data and thus are most likely to engage in data sharing behaviour while researchers in training are the group that is least likely to do so.

For data reusing behaviour, only little is known about the differences in data reusing behaviour across career stages. Hrynaszkiewicz and colleagues (2021) analysed the perceived importance of data reusing across different career stage groups and indicated that early career stage researchers perceive higher importance compared to mid or senior career stage researchers. However, even though earlier career stage researchers had the highest perceived importance scores, they were less likely to make individual requests (Hrynaszkiewicz et al., 2021). Thus, even though earlier career stage researchers think that data reusing is important, they are less likely to engage in data reusing behaviour. Since the current literature proposed mixed findings on the moderating effect of the researcher's career stage on the relationship between perceived career benefit and data sharing and reusing behaviour, further investigation is needed to clarify

the effect of researchers' career stage on the association between data sharing and reusing behaviour of scientists within the traumatic stress field.

The Current Study

This study aimed to extend the knowledge on data sharing behaviour by examining the association between perceived career benefit and data sharing behaviour within the traumatic stress field. Based on the findings from previous research (Bordia et al., 2004; Kim, 2013; Kim & Adler, 2015; Kim & Stanton, 2015; Kim & Zhang, 2015; Van den Eynden, 2018), it was expected that perceived career benefit has a positive relationship with data sharing behaviour. Additionally, since previous research found mixed findings on the differences between researchers' career stage and their perceived career benefit scores as well as in their data sharing behaviour, this study compared senior and junior career stage researchers and investigated whether the relationship between perceived career benefit and data sharing behaviour is moderated by researchers' career stage. Due to the previously mentioned finding from Campbell and colleagues (2019), that senior career stage researchers perceive less career benefit in data sharing and are therefore less likely to engage in data sharing behaviour, it was expected that the relationship between perceived career benefit and data sharing behaviour is weaker for senior career stage researcher. Figure 1 shows the moderation model of the described relationship between the three variables.

Figure 1

Moderation Model for the Expected Relationship Between Perceived Career Benefit and Data Sharing Behaviour Moderated by Career Stage.
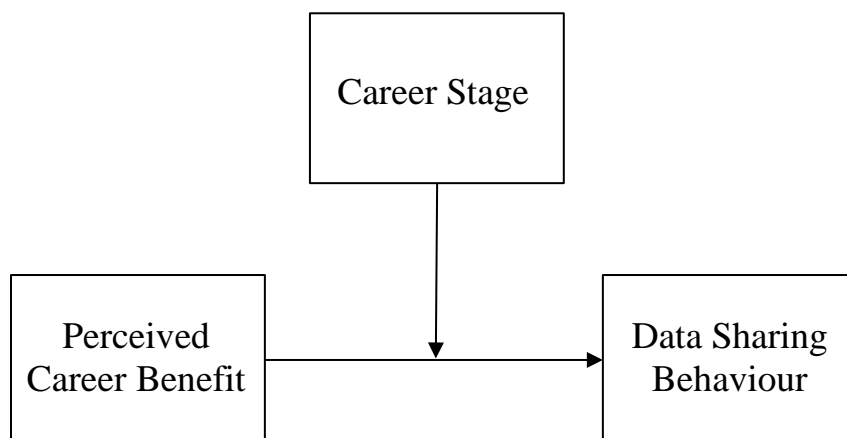
Furthermore, this study extended prior research by examining the association between perceived career benefit and data reusing behaviour, which has barely been studied before. Since it was found that data reuse was associated with a higher citation rate (Piwowar & Vision, 2013), a positive relationship between the two variables was predicted. Moreover, this study investigated if the researcher's career stage moderated the relationship between perceived career benefit and data reusing behaviour. Since it was found that early career stage researchers are less likely of making an individual request (Hrynaszkiewicz et al., 2021), it was expected that the relationship between perceived career benefit and data reusing behaviour is weaker for junior career stage researcher. Figure 2 shows the moderation model of the described relationship between the three variables.

Figure 2

Moderation Model for the Expected Relationship Between Perceived Career Benefit and Data Reusing Behaviour Moderated by Career Stage.
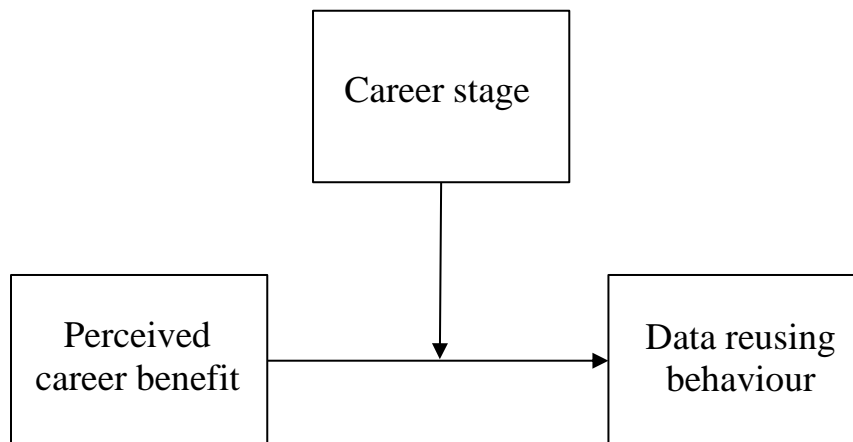
Methods

Participants

The target population of the study were scientists at any career stage working in the traumatic stress field. Participants were invited independently from their geographical region, their belonging discipline within the traumatic stress field, their age, their years of conducting research, or work experience. Participants who were proficient in any of the following languages were eligible to participate: Arabic, Brazilian Portuguese, English, French, Japanese, Korean, and Spanish.

Procedure

Before the data collection started, the Committees for the Protection of Human Subjects (IRB) of the Children's Hospital of Philadelphia approved this research to meet the necessary requirements. The data collection started in May 2021. By using a purposive data collection method, potential participants were invited to participate in the study via email based on a web-based investigation of different journals concerning the traumatic stress field. Furthermore, announcements for participation were posted on social media and spread during international psychotrauma-conferences. Moreover, a snowball sampling method was applied since the researchers who received the email with the invitation to the questionnaire were also invited to send the questionnaire to colleagues and other research teams. Therefore, specific numbers of invitations sent are not available. The email that was distributed to the researchers included a recruitment message (see Appendix A), shortly stating the purpose of the study, that completing the survey will take approximately 10 minutes and a hyperlink to the online survey. Regarding the questionnaire (see Appendix B) the participants gave their informed consent by continuing the questionnaire after reading the introduction paragraph including that the participation is voluntary and anonymous without known risks or personal benefits for the participant. In case the participant had questions about the survey, the study, or the dataset a link to contact the study team was included in the introduction paragraph of the survey as well. After completing the questionnaire, the participants had the opportunity to share any additional comments about their views or experiences regarding data sharing or data reuse.

Measures

General Information About the Survey

Within this survey, several demographics of the participants were asked. Besides the standard demographics, such as age, gender, country of work and life, the survey includes several aspects belonging to the academic background including the discipline the participant is working in and the years of conducted research. Since this research is assessing the data sharing behaviour of researchers within the traumatic stress field, the survey only includes options within this discipline such as Psychology, Psychiatry, Medicine and other than Psychiatry, Nursing, Social Work, Public Health, Education, and Others. Furthermore, the participant had to specify their current job title or highest academic rank ranging from full professor to master student, how many publications the participant was involved in for the last five years (including first- and co-

author), what type of population (adults, adolescence, or children) they included in their research, and what type of data (Data from survey/questionnaire, Data from standard interviews, Qualitative data, Intensive longitudinal (EDA/ESM) data, Experimental task performance data, Genetic data, Biological/physiological data (other than genetic), Data retrieval from health/medical records, Data from other non-research records or sources (administrative data, online/social media data), Other) they collected. Furthermore, before the participants continued to answer questions regarding data sharing and data reusing behaviour several definitions, including data sharing, data reuse, and metadata were given to ensure a higher validity of the measures. Excluding the demographic background questions, the online survey consisted of 48 items that were assessed and collected by N. Kassam-Adams and her team. Overall the questionnaire measured diverse constructs, while only three, namely, perceived career benefit, data sharing, and data reusing, were included in this study.

Perceived Career Benefit

For measuring the variable perceived career benefit, two items were selected that were already been used in previous research (Bock et al., 2005; Kim, 2013; McLure Wasko & Faraj, 2000). The two items that were included in the questionnaire are: *I can earn academic 'credit' such as more citations by sharing data.*, and *Data sharing would be helpful in my academic career*. In order to assess the individual scores, a 7-point Likert scale was used ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). For the analysis, participants' perceived career benefit scores were summarized, ranging from 2 to 14. The internal consistency of the perceived career benefit items was sufficient ($\alpha = .75$).

Data Sharing Behaviour

In order to measure the data sharing behaviour of the participants, six items were used in the online survey. The items that were used to assess the data sharing behaviour of scientists ask how frequently the scientists: *Deposited your data, RELATED TO AN ARTICLE YOU PUBLISHED, into an institutional repository (i.e. repository maintained by a journal, university, funder, national data archive, etc)?*, *Uploaded your data, RELATED TO AN ARTICLE YOU PUBLISHED, into a "public" Webspace (e.g. PsyArxiv, MedArxiv, OSF)?*, *Deposited your data/dataset, NOT IN CONNECTION TO A SPECIFIC PUBLICATION, into an institutional repository?*, *Uploaded your data/dataset, NOT IN CONNECTION TO A SPECIFIC PUBLICATION, into a "public" Webspace?*, *Been personally asked to share data for an article you published?*,

Provided data (in response to a request) via personal communication methods? (e.g., email or file share)?. As a measurement scale, a 3-point Likert scale was used including the responses: *never* (1), *1 or 2 times* (2), and *more than two times* (3). For the analysis, the participant's data sharing scores were summarized, ranging from 6 to 18. The internal consistency of the data sharing items was sufficient ($\alpha = .74$).

Data Reusing Behaviour

To measure the variable data reusing behaviour, four items were used that were newly developed. The items ask how frequently the participants: *Downloaded or requested data from a repository for your own analyses/research?*, *Directly requested data from another researcher/research team for use in your own work?*. *Collaborated with other researchers to combine (your & their) data for new analyses / new work?*, *Published results of work that included use of others' data?*. As a measurement scale, a 3-point Likert scale was used including the responses: *never* (1), *1 or 2 times* (2), and *more than two times* (3). For the analysis, the participant's data reusing scores were summarized, ranging from 4 to 12. The internal consistency of the data reusing items was sufficient ($\alpha = .76$).

Career Stage

To measure whether researchers' career stage has a moderating effect on the relationship between perceived career benefit and data sharing and reusing behaviour, career stages were divided into two groups namely senior, and junior career stage researchers. The career stages were listed from the highest to the lowest possible indication ranging from 1 "Full Professor" to 9 "Other". The first two stages, so "Full Professor" (1), and "Associate Professor" (2) were categorized as senior career stages. The other career stages namely "Assistant Professor/Lecturer" (3), "Instructor" (4), "Research Scientist" (5), "Post-Doctoral trainee" (6), "Doctoral/PhD students" (7), "Master students" (8) and "Others" (9) were categorized as Junior career stages. 9 was included in the junior career stage since all the participants who mentioned others and indicated their titles all fit the Junior career stage category.

Data Analysis

For the data analysis, the statistical program IBM SPSS Statistics (IBM Corp., 2017) was used. Before analysing the data, a priori power analysis for a sample size estimation was conducted using the G*Power version 3.1.9.7 (Faul et al., 2009). By using a significance criterion of $\alpha = .05$, while estimating a medium effect, and by using a power of 80%, the

minimum sample size needed was N = 55. Additionally, the data were tested for normality by applying the Kolmogorov-Smirnov test and the Shapiro-Wilk test for each variable. Based on the results, the null hypothesis that the perceived career benefit, the summed data sharing and reusing scores are normally distributed was rejected due to significant findings in both aforementioned tests, suggesting that the data is not normally distributed.

Afterwards, descriptive statistics were analysed in order to describe the sample in detail. Additionally, since the data appeared to be not normally distributed, median scores were provided for the summed perceived career benefit, data sharing and reusing scores to get a general impression of the frequency of each variable within the traumatic stress field. In order to distinguish if the perceived career benefit, data sharing and reusing median scores of the sample are low, normal or high, the summed scores were divided into three brackets. For the summed perceived career benefit scores, the brackets ranged from "2-5" (low), "6-10" (normal), and "11-14" (high). The brackets for the summed data sharing scores ranged from "6–9" (low), "10-14" (normal), and "15-18" (High). Lastly, for the summed data reusing scores, the brackets ranged from "4-6" (low), "7-9" (normal), "10-12" (high).

To test the first hypothesis, whether perceived career benefit has a positive relationship with data sharing behaviour, a linear regression analysis was conducted. The same analysis was used to test the third hypothesis, whether perceived career benefit has a positive relationship with data reusing behaviour. Furthermore, the Kruskal Wallis test was used to test for differences in each variable between the two career stage groups. Lastly, to examine to what extent the career stage moderated the associations between perceived career benefit and data sharing and data reusing behaviour, two moderation analyses were conducted using the SPSS package "PROCESS" by Andrew F. Hayes.

Results

Descriptive Statistics

The sample consisted of 218 participants in total. The majority of the participants were European (38.1%), female (57.8%), most likely belonging to the age group of 30-39 (29.8%) and were categorized as junior career stage researchers (66.1%). The overall data sharing scores in this sample were low (Mdn = 8), while data reusing scores were low (Mdn = 6), and perceived career benefit scores were high (Mdn = 10). Table 1 displays a list of the participant demographics.

Table 1

Demographics of the Sample (N = 218)

Characteristic	N (%)	M	SD
Gender			
Male	84 (38.5%)		
Female	126 (57.8%)		
Other	8 (3.8%)		
Total	213 (97.7%)		
Age			
20-29	26 (11.9%)		
30-39	65 (29.8%)		
40-49	52 (23.9%)		
50-59	32 (14.7%)		
60-69	21 (9.6%)		
70+	6 (2.8%)		
Total	202 (92.7%)		
Region			
Africa	5 (2.3%)		
Asia	29 (13.3%)		
Australia	13 (6.0%)		
Europe	83 (38.1%)		
Middle East	6 (2.8%)		
North America	56 (25.7%)		
South America	22 (10.1%)		
Total	214 (98.2%)		
Discipline			
Psychology	130 (59.6%)		
Psychiatry	40 (18.3%)		
Other Discipline	46 (21.1%)		

Total	216 (99.1%)		
Career stage			
Senior	72 (33.0%)		
Junior	144 (66.1%)		
Total	216 (99.1%)		
Researched population	113 (51.8%)		
Adults	28 (12.8%)		
Adolescents	75 (34.4%)		
Children	216 (99.1)		
Total			
Number of publications in the last 5 years		18.08	25.92
How many of these publications involved analysis of researched data collected by others		3.62	8.52
Type of trauma			
Acute/Single Trauma	2 (.9%)		
Child Abuse/Maltreatment	2 (.9%)		
Chronic/Repeated Trauma	6 (2.8%)		
Death/Bereavement	6 (2.8%)		
Disaster	6 (2.8%)		
Intimate Partner Violence	7 (3.2%)		
Medical Trauma	8 (3.7%)		
Racism/Historical Trauma	1 (.5%)		
Rape/Sexual Assault	32 (14.7%)		
Refugee/Displacement Experiences	7 (3.2%)		
Secondary/Vicarious Traumatization in Professionals/Helpers	17 (7.8%)		

Terrorism	8 (3.7%)
Torture	5 (2.3%)
War/ Post-Conflict Settings - Civilians	8 (3.7%)
War/ Military/Peacekeeper/Veterans	40 (18.3%)
Other(s)	20 (9.2%)
Total	175 (80.3%)
Type of collected data	
Data from Survey / Questionnaires	17 (7.8%)
Data from Standard Interviews	14 (6.4%)
Qualitative Data	38 (17.4%)
Intensive Longitudinal (EMA/ESM) Data	9 (4.1%)
Experimental Task Performance Data	11 (5%)
Genetic Data	1 (.5%)
Biological / Physiological Data (other than Genetic)	31 (14.2%)
Data retrieved from Health/Medical records	52 (23.9%)
Data from other non-research records or sources (Administrative data, online/social media data)	37 (17%)
Other	6 (2.8%)
Total	216 (99.1%)

Perceived Career Benefit and Data Sharing and Reusing Behaviour

The linear regression analysis showed that perceived career benefit was not significantly associated with data sharing behaviour (β = -.06, SE = .06, p = .429). Thus, the first hypothesis, that perceived career benefit has a significant positive relationship with data sharing behaviour, was rejected. Furthermore, the linear regression analysis showed that perceive career benefit was not significantly associated with data reusing behaviour (β = -.01, SE = .05, p = .841). Thus, the third hypothesis, that perceived career benefit has a significant positive relationship with data reusing behaviour, was rejected.

Testing for Differences Between the Career Stage Groups

A significant difference was found between the two career stage groups regarding their data sharing behaviour ($H(1) = 36.32$, $p < .001$). Furthermore, significant differences were found for their data reusing behaviour ($H(1) = 16.95$, $p < .001$). Senor researchers reported significantly higher data-sharing and re-using scores compared with junior researchers. No significant difference was found between the two career stage groups for the summed perceived career benefit scores ($H(1) = .15$, $p = .696$). Table 2 shows the mean rank scores of the groups for each variable.

Table 2

Summary of the Mean Rank Scores for Each Variable

		Senior	Junior
Data Sharing Behaviour	Mean Rank Score	143.41	90.04
	n	70	144
Data Reusing Behaviour	Mean Rank Score	129.71	93.72
	n	72	139
Perceived Career Benefit	Mean Rank Score	104.20	107.66
	n	71	141

Moderation by Career Stage

The moderation analysis indicated that the career stage did not have a significant moderating effect on the relationship between perceived career benefit and data sharing behaviour (β = -.06, t = -.56, p = .577). Thus, the second hypothesis, that career stage moderates the relationship between perceived career benefit and data sharing behaviour, was rejected.

Moreover, even though a significant main effect between data reusing and career stage was found (β = -2.49, t = -2.40, p = .017), career stage was found to have no significant moderating effect on the relationship between perceived career benefit and data reusing behaviour (β = .11, t = 1.08, p = .28). Therefore, hypothesis 4, that career stage moderates the relationship between perceived career benefit and data reusing behaviour, was rejected. Table 3 shows a summary of the main and the moderation effects.

Table 3

Main Effects and Moderation Effects.

	Data Sharing			Data Reusing		
	Perceived Career Benefit	Career Stage	Moderation	Perceived Career Benefit	Career Stage	Moderation
β	.07	-1.79	-.06	-.16	-2.49	.11
t-value	.42	-1.65	-.56	-.99	-2.40	1.08
p-value	.676	.100	.577	.323	.017	.28
LLCI	-.27	-3.94	-.27	-.49	-4.53	-.09
ULCI	.42	.35	.15	.16	-.45	.31

Note. Table 3 shows the output of the moderation analysis. *Perceived Career Benefit* and *Career Stage* indicate the main effects on *Data Sharing* and *Data Reusing*. *Moderation* shows the moderation effect by *Career Stage* on the relationship between *Perceived Career Benefit* and *Data Sharing* and *Data Reusing*.

Discussion

This study aimed to investigate whether the previous findings on the relationship between perceived career benefit and data sharing behaviour can be generalized to the field of traumatic stress. Furthermore, since today's literature has mixed findings on data reusing behaviour, the aim of this study was to extend the knowledge by examining the relationship between perceived career benefit and reusing behaviour within the traumatic stress field. Additionally, this study tested if the researchers' career stage had a moderating effect on the two previously mentioned relationships.

Regarding the first hypothesis, no significant relationship was found between perceived career benefit and data sharing behaviour. This would mean that the findings from previous research (Bordia et al., 2004; Kim, 2013; Kim & Adler, 2015; Kim & Stanton, 2015; Kim & Zhang, 2015; Van den Eynden, 2018) cannot be generalized to the traumatic stress field. An explanation for the finding that perceived career benefit had no significant relationship with data sharing behaviour would be that data sharing is not common practice in the traumatic stress field and thus, no significant relationship could be detected. An indication of this explanation is the low median value of the summed data sharing scores and that the data were not normally distributed. An alternative explanation would be that data sharing behaviour and perceived career benefit need to be investigated by using a different conceptualization. The questionnaire might not or not fully cover all the different aspects of data sharing and perceived career benefit and thus the analysis revealed no significant relationship between perceived career benefit and data sharing behaviour.

Secondly, this study did not find a significant relationship between perceived career benefit and data reusing behaviour of scientists within the traumatic stress field. This finding is conflicting with the suggestions from previous research (Curty & Qin, 2015; Piwowar & Vision, 2013), and suggests that perceived career benefit does not have a positive relationship with data reusing behaviour at least in the traumatic stress field. An explanation for this finding is that data reusing depends to some degree on data sharing behaviour, in terms that when no data is shared, no data could be reused. Therefore, the previously mentioned aspect that data sharing is not common practice in the traumatic stress field also explains the findings on data reusing behaviour. Alternatively, since the relationship between perceived career benefit and data reuse

has only barely been studied before, the findings from this study could also simply mean that there is no significant relationship between perceived career benefit and data reusing behaviour.

Furthermore, significant differences between the two career stage groups in traumatic stress researchers' data sharing and reusing behaviour were found. According to the results, senior career stage researchers had significantly higher data sharing scores. This outcome is in line with the suggestion from Zhu (2019), who found that senior career stage researchers are most likely to engage in data sharing behaviour while trainee stage researchers are least likely to do so. Additionally, this study showed that senior career stage researchers reused data more often compared with junior career stage researchers. This finding supports the suggestion from Hrynaszkiewicz and colleagues (2021), who found that even though earlier career stage researchers have higher perceived importance for data reuse, they hesitate to make individual requests. Furthermore, no significant difference was found in the participants' perceived career benefit scores between the two career stage groups. The findings of the group differences suggest that data sharing and reusing behaviour differ between the two career stages, but that the differences are not explained by perceived career benefit.

Lastly, no moderation effect of the researcher's career stage was found for either of the previously expected relationships between perceived career benefit and data sharing and reusing behaviour, suggesting that the researcher's career stage does not moderate the relationship between the previously mentioned relationships. The aforementioned explanation that perceived career benefit was measured insufficiently could again be used to explain the findings that no moderation effect of career stage could be detected. However, further research is needed to validate the findings.

Strength and Limitations of the Study

A strength of this study is that the data was collected by using an international survey which was accessible in multiple languages. Providing the questionnaire in multiple languages like Arabic, Brazilian Portuguese, English, French, Japanese, Korean, and Spanish, reduces the likelihood of language barriers and thus, positively affects the validity of the measurement. Additionally, the derived estimated required sample size was 55, while this study used a sample consisting of 218 participants. This means that the sample consisted of a more than a sufficient number of participants. Furthermore, the study investigated the data sharing and reusing

behaviour of scientists within the traumatic stress field in an exploratory manner and indicated that data sharing is not common practice within the traumatic stress field.

However, even though this study contains certain positive aspects, the findings need to be considered in connection with several limitations. A primary limitation of this study was that the online questionnaire only used two items to measure the variable perceived career benefit. This could mean that the questionnaire did not cover all relevant aspects of the perceived career benefit, which might have negatively affected the reliability of the results on the relationship between perceived career benefit and data sharing and reusing behaviour. Consequently, due to the limited number of items used to measure perceived career benefit, the results of this study should be used as a signal function at its best. Further research is needed that includes a diverse conceptualization of the variable perceived career benefit to clarify the relationship between perceived career benefit and data sharing and reusing behaviour within the traumatic stress field.

Another limitation is that this study summed the data sharing scores instead of considering multiple data sharing aspects for the analyses. Even though analysing and reporting the summed data sharing and reusing scores gives a general impression of the data sharing and reusing practices within the traumatic stress field, it does not allow a detailed view which data sharing and reusing behaviours are actually executed by researchers within the field. A more detailed view on the data sharing and reusing behaviour could enable researcher and organizations to identify relevant needs and barriers with the aim to improve the data sharing and reusing practices within the traumatic stress field. Therefore, further research is needed that considers a different conceptualization of data sharing behaviour to strengthen the knowledge on data sharing and reusing behaviour within the traumatic stress field.

Thirdly, due to the aim of the study, it was required to sample a very specific type of population namely researchers within the traumatic stress field. Therefore, this study applied a purposive and snowball sampling method to reach and recruit a sufficient number of participants, which could have negatively affected the representativeness of the results.

Implementations of the Findings

Based on the findings from this study, several implementations into today's literature as well as a direction for further research or interventions can be given. First, the previously mentioned limitations of this study regarding the insufficient conceptualization of perceived career benefit and data sharing behaviour should be considered as a signal function for future

research. As an orientation, Kim (2017) found that perceived career benefit only had a significant positive relationship with *submitting data as journal supplements*, while it was found to have no significant relationship with *providing data via personal communication methods (e.g., upon request)* and *making data accessible through data repositories*. Further research should consider using the aforementioned aspects to get a more detailed overview of the data sharing behaviour of scientists within the traumatic stress field. Moreover, regarding the conceptualization of perceived career benefit, Kim (2013) mentioned the aspects of *increased citation*, *possible credits*, and *demonstration of quality work*, to be highly valuable and desirable for researchers. Further research should include these three aspects to the analysis to receive more accurate results on the relationship between perceived career benefit and data sharing behaviour. Additionally, further research should also analyse which of the three aspects mentioned in Kim (2013) is the most relevant for the perceived career benefit of researchers, to extend the knowledge on the relationship between perceived career benefit and data sharing behaviour and to set the basis for new interventions.

Furthermore, the findings from this study suggested that data sharing and reusing behaviour are not common practices within the field of traumatic stress. Within their paper, Kassam-Adams and Olff (2020) described four principles for ideal data sharing and reusing conditions also known as the FAIR principles. According to the FAIR principles, the data needs to be *findable*, so listed in a searchable index, *accessible*, including clear means of requesting the data, *interoperable*, so encoded and readable for various software systems, and *re-usable*, so richly described to fulfil domain-specific standards (Kassam-Adams & Olff, 2020). To apply the FAIR principles to the field of traumatic stress, the findings on the differences in data sharing and reusing behaviour between the two career stage groups suggest that interventions to improve the data sharing and reusing situation should especially focus on earlier career stage researchers. As also mentioned by experts in the field such as Kassam-Adams and Olff (2020) or Zhu (2019), the findings from this study suggest lack of training, which should focus on the education of i.e., data stewardship or the reduction of perceived career risks instead of focussing on increasing the perceived career benefit of researchers within the field. With this knowledge, future interventions and training needs to be provided to encourage especially earlier career stage researchers to engage in data sharing and reusing behaviour as we are sitting on a highly untouched but

valuable and innovative chance to revolutionize the research within the traumatic stress field (Kassam-Adams and Olff, 2020).

Conclusion

This study suggested that the relationship between perceived career benefit and data sharing behaviour cannot be generalized to the traumatic stress field. However, perceived career benefit was insufficiently covered by the online survey which means that the conclusions that were drawn from this study should exclusively be considered as a signal function. Furthermore, this study has shown that data sharing and data reusing are still not common practices within the traumatic stress field and that training especially for earlier career stage researchers is needed to improve the data sharing and reusing behaviour situation. Thus, data sharing and reusing need to become a shared goal of the traumatic stress field community, to deploy its enormous potential, but until then, it is still a long way connected with a lot of work.

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Appendices

Appendix A. *Recruitment message*

Dear [Name],

My name is Simon Gehling and I am a psychology student at the University of Twente and currently working on my Bachelor thesis. In cooperation with Lonneke Lenferink, Nancy Kassam-Adams, and the Global Collaboration on Traumatic Stress, we are conducting an international survey to better understand traumatic stress researchers' opinions and experiences regarding data sharing and data re-use. Therefore, we are recruiting traumatic stress researchers at any career stage (including trainees) to share opinions and experiences by participating in the following survey. The survey will take approximately 10 min to complete.

The results of this global survey will be shared on the Global Collaboration website (https://www.global-psychotrauma.net/) and in scientific publications and it will help us to create tools and resources for traumatic stress researchers. The final dataset from this survey will be available upon request for use by other researchers.

Participation is voluntary and there are no known risks or personal benefits to you from participating in this study.

As the survey is available in multiple languages (English, Japanese, Spanish, French, Portuguese, Korean, and Arabic), we would kindly ask to participate if you are proficient in one of the available languages.

If you have questions about the survey, the study, or the study dataset, please contact the study team at childtraumadata@chop.edu.

Follow this link to the survey:

https://www.global-psychotrauma.net/data-sharing

Thank you for your participation.

Regards,

Simon Gehling

University of Twente, NL

Appendix B. International Survey on Data Sharing and Reusing Behaviour in Traumatic Stress Research

The Global Collaboration on Traumatic Stress, a coalition of 11 scientific societies in the field of traumatic stress, is conducting a survey to better understand traumatic stress researchers' opinions and experiences regarding data sharing and data re-use. Results of this global survey will be shared on the Global Collaboration website (https://www.global-psychotrauma.net/), and will help us create tools and resources for traumatic stress researchers. The final dataset from this survey will be available upon request for use by other researchers.

If you are a traumatic stress researcher at any career stage (including trainees) we invite you to share your opinions and experiences by participating in this survey. The survey is anonymous, and your participation is voluntary. There are no known risks or personal benefits to you from participating in this study.

If you have questions about the survey, the study, or the study dataset, please contact the study team at childtraumadata@chop.edu.

By continuing to the survey, you are consenting to participate in this study.

THANK YOU for your participation.

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Part 1 - So that we can describe the respondents to this survey, please tell us a bit about yourself.

 1. *What is your academic / research discipline? CHECK ALL THAT APPLY*

- *Psychology*

- *Psychiatry*

- *Medicine – other than psychiatry - specify:*

- *Nursing*

- *Social Work*

- *Public Health*

- *Education*

- *Other – Specify: _____*

2. How many years have you been conducting research in this discipline? (include research conducted during your training, e.g., masters, doctoral, or any post-graduate/professional research)

3. What is your current job title / academic rank / trainee status? If multiple apply, select highest rank.

- *Full Professor*

- *Associate Professor*

- *Assistant Professor / Lecturer*

- *Instructor*

- *Research scientist*

- *Post-doctoral trainee*

- *Doctoral/PhD student*

- *Masters student*

- *Other – Specify: _____*

4. In the last 5 years, how many publications involving research data have you published (including those as first author or co-author)?

5. How many of these publications involved analyses of research data collected by others outside you / your research team / your co-authors?

6. Is trauma / traumatic stress your primary research focus? Yes / No

SKIP PATTERN – If no ITEM 6 then go to ITEM 7

If yes – go to ITEM 8

7. What is your primary area of research?

8. What types of trauma have been included in your research? CHECK ALL THAT APPLY

- *Acute/Single trauma*

- *Child Abuse/Maltreatment*

- *Chronic/Repeated Trauma*

- *Community Violence*

- *Death/Bereavement*

- *Disaster*

- *Intimate Partner Violence*

- *Medical Trauma*

- *Racism / Historical Trauma*

- *Rape/Sexual Assault*

- *Refugee/Displacement Experiences*

- *Secondary / Vicarious Traumatization in Professionals / Helpers*

- *Terrorism*

- *Torture*

- *War / Post-Conflict Settings – Civilians*

- *War – Military/Peacekeepers/Veterans*

- *Other(s) – Specify: _____*

9. *What populations have been included? CHECK ALL THAT APPLY*

- *Adults*

- *Adolescents*

- *Children*

10. What types of data have you collected? CHECK ALL THAT APPLY

-   Data from surveys / questionnaires

-   Data from standard interviews

-   Qualitative data

-   Intensive longitudinal (EMA / ESM) data

-   Experimental task performance data

-   Genetic data

-   Biological / physiological data (other than genetic)

-   Data retrieved from health / medical records

-   Data from other non-research records or sources (administrative data, online / social media data)

-   Other – Specify: _____

11. What is your age in years?

12. How do you identify your gender?

-   Male

-   Female

-   Non-binary

-   Other

-   Prefer not to say

13. Do you consider yourself to be of an ethnic / cultural background that is under-represented amongst researchers in the discipline / research community in which you work?”

Yes / No / Prefer not to say

14. In what country do you live and work? [DROP DOWN LIST – SEE LIST AT END OF THIS DOC]

Part 2 - Please indicate to what extent you agree with the following statements, thinking about the institutions and research communities that you are part of.

IN MY RESEARCH COMMUNITY ....

RESPONSES FOR THIS SECTION: 1, Strongly Disagree | 2, Moderately Disagree | 3, Slightly Disagree | 4, Neutral | 5, Slightly Agree | 6, Moderately Agree | 7, Strongly Agree | -99, Don't Know

15. It is expected that researchers would share data.

16. Researchers share data even if not required by policies.

17. Many researchers are currently participating in data sharing.

18. Public funding agencies require researchers to share data.

19. Journals require researchers to share data.

20. Researchers can easily access metadata about existing data sources.

21. Researchers have the tools they need to share appropriate metadata along with their data.

22. Data repositories are available for researchers to deposit / share their data.

23. Researchers can easily access data repositories to request / acquire data for re-use.

24. It is difficult to publish work that is based in data re-use, i.e. new analyses of data collected by others.

25. Re-using data for new / secondary analyses has led to advances in the field.

Part 3 - Thinking about YOUR OWN VIEWS AND EXPERIENCES, please indicate the extent to which you agree with the following statements.

RESPONSES FOR THIS SECTION: 1, Strongly Disagree | 2, Moderately Disagree | 3, Slightly Disagree | 4, Neutral | 5, Slightly Agree | 6, Moderately Agree | 7, Strongly Agree

 26. I am willing to help other researchers within my institution / research community by sharing data.

27. I am willing to help other researchers outside my institution / research community by sharing data.

28. I can earn academic 'credit' such as more citations by sharing data.

29. Data sharing would be helpful in my academic career.

30. Sharing data is an ethical obligation as a researcher.

31. Sharing data honors the contributions of research participants.

32. Sharing data has a high risk of violating the rights of research participants.

33. There is a high probability of losing publication opportunities if I share data.

34. Data sharing may cause my research ideas to be stolen by other researchers.

35. My shared data may be misused or misinterpreted by other researchers.

36. I believe that the overall riskiness of sharing data is high.

37. Sharing data involves too much time for me (e.g. to organize / annotate).

38. I would find data sharing difficult to do.

39. I have adequate time and funding for any effort that may be required in sharing my data.

40. I include statements about data sharing in my participant consent forms.

41. My institution's ethics committee / IRB makes it hard for me to share research data gathered in IRB approved studies.

42. When I begin a project, I organize the data to enable later data re-use and sharing.

43. I feel prepared (via training or experience) to manage my data in a way that facilitates re-use and sharing.

44. I know how to de-identify / anonymize my data so that it can be shared.

45. I know how to clearly document how my raw data was processed / cleaned for analysis.

> *46. Re-using other researchers' data can improve the quality of my overall program of research.*

> *47. Re-using other researchers' data reduces the time/cost/effort I spend on my research.*

> *48. If I re-use other researchers' data, I worry that I might misinterpret the data.*

49. If I re-use other researchers' data, I worry that I might not be able to publish with that data.

50. Re-using other researchers' data requires too much time and effort to locate data sets.

51. Re-using other researchers' data requires too much time and effort to access (or get permission to use) data sets.

52. Re-using other researchers' data requires too much time and effort to process data sets for a new study.

Part 4 - How often have you...

RESPONSES FOR THIS SECTION: Never | 1 or 2 times | More than 2 times

53. Deposited your data, RELATED TO AN ARTICLE YOU PUBLISHED, into an institutional repository (i.e. repository maintained by a journal, university, funder, national data archive, etc)?

54. Uploaded your data, RELATED TO AN ARTICLE YOU PUBLISHED, into a "public" Web space (e.g. PsyArxiv, MedArxiv, OSF)?

55. Deposited your data / dataset, NOT IN CONNECTION TO A SPECIFIC PUBLICATION, into an institutional repository?

56. Uploaded your data / dataset, NOT IN CONNECTION TO A SPECIFIC PUBLICATION, into a "public" Web space?

57. Been personally asked to share data for an article you published?

58. Provided data (in response to a request) via personal communication methods? (e.g., email or fileshare)?

59. Downloaded or requested data from a repository for your own analyses / research?

60. Directly requested data from another researcher / research team for use in your own work?

61. Collaborated with other researchers to combine (your & their) data for new analyses / new work?

62. Published results of work that included use of others' data?

Part 5 – Any additional comments?

63. Please share any additional comments about your views or experiences regarding data sharing or data re-use: OPEN TEXT FIELD

Portions of this survey were adapted from the following studies:

Kim, Y. (2013). Institutional and Individual Influences on Scientists' Data Sharing Behaviors (Doctoral Dissertation). surface.syr.edu/it_etd/85/.

Kim, Y., & Stanton, J. M. (2016). Institutional and Individual Factors Affecting Scientists'

Data-Sharing Behaviors: A Multilevel Analysis. Journal of the Association for Information Science and Technology, 67(4), 776–799. https://doi.org/10.1002/asi.23424

Kim, Y., & Yoon, A. (2017). Scientists' data reuse behaviors: A multilevel analysis. Journal of the Association for Information Science and Technology, 68(12), 2709–2719. https://doi.org/10.1002/asi.23892