Effecten van QuikScan op tekstbegrip

Bachelorthese

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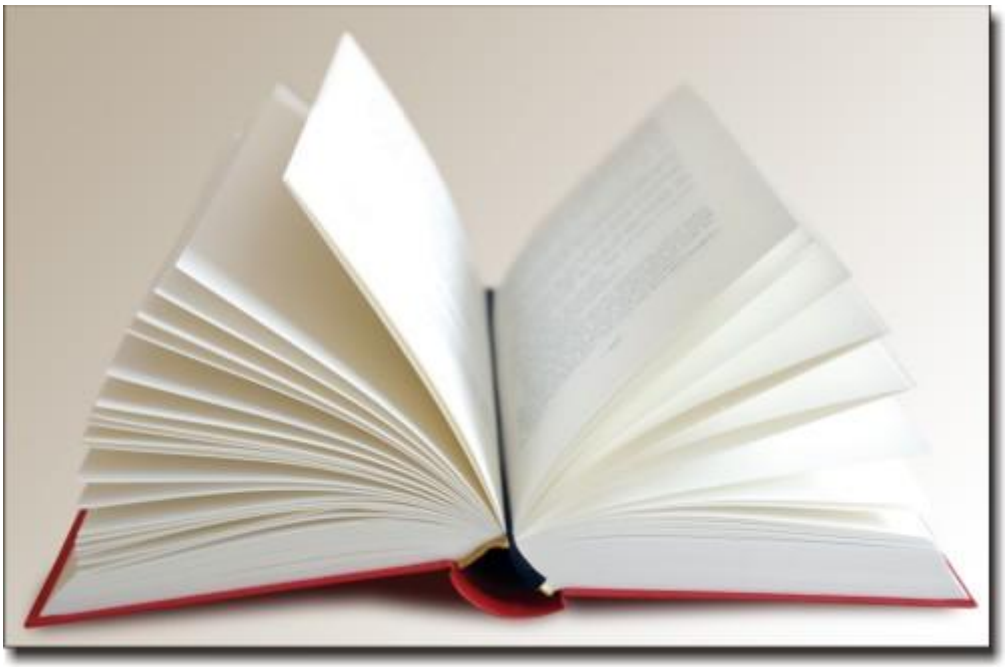

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Samenvatting

Achtergrond: *Lezen kan een probleem zijn als mensen een tekst niet goed begrijpen. QuikScan is een nieuw ontwikkelde methode die als doel heeft lezen te vergemakkelijken.*

Doel: *Het doel van deze studie was om de hypothese te testen dat QuikScan tekstbegrip bevordert en dat teksten die met QuikScan bewerkt zijn hoger gewaardeerd worden op interesse, begrijpelijkheid en structuur.*

Methode*: 20 proefpersonen kregen een tekst te lezen met een gestructureerd abstract, 20 proefpersonen kregen dezelfde tekst te lezen die met QuikScan bewerkt was. Daarna moesten ze een vragenlijst over persoonlijke karakteristieken en een vragenlijst over tekstperceptie invullen en open vragen over de inhoud van de tekst beantwoorden.*

Resultaten: *De proefpersonen die de met QuikScan bewerkte tekst gelezen hebben waren significant beter bij het beantwoorden van de vragen dan de proefpersonen die de tekst met de gestructureerd abstract gelezen hebben. Maar er was geen verschil tussen de groepen in de beoordeling van de tekst op interesse, begrijpelijkheid en structuur.*

Conclusie: *QuikScan helpt mensen een tekst beter te begrijpen maar zorgt er niet voor dat teksten significant hoger gewaardeerd worden.*

Keywords: QuikScan, begrijpend lezen, structured abstracts

Inhoudsopgave

1. Inleiding

Wie kent het niet: Je leest een tekst en weet aan het eind nauwelijks (meer) wat er eigenlijk in staat.

Lezen is een activiteit met die we dagelijks geconfronteerd worden. Informatie die we nodig hebben halen we meestal uit teksten. Maar in de begrijpelijkheid van teksten zijn grote verschillen. Als informatie al bij het lezen niet goed begrepen wordt, wordt de verwerking van informatie negatief beïnvloed. Het is dus van belang dat teksten zo geschreven en ontworpen zijn dat tekstbegrip eenvoudig verkregen kan worden. Er zijn veel verschillende methoden die als doel hebben het lezen en de ontwikkeling van tekstbegrip te vergemakkelijken, zoals bijvoorbeeld inhoudsopgaven, kopjes en samenvattingen.

QuikScan is een relatief nieuw ontwikkelde methode die een aantal hulpmiddelen en methoden combineert om tekstbegrip zo goed al mogelijk te bevorderen (Zhou, 2008). Met QuikScan is een methode ontwikkeld die het makkelijker maakt om teksten snel op belangrijke punten te scannen en de essentie in een korte tijd er uit te halen. QuikScan is bedoeld om het lezen van documenten te vereenvoudigen zonder hun structuur ingrijpend te onderbreken of te veranderen (Zhou, 2008). Het design van QuikScan berust op twee basisprincipes. Ten eerste het samenvatten van alinea's tekst in begrijpelijke, korte zinnen in boxen die tussen de tekst staan. Ten tweede het plaatsen van nummers bij de samenvattende zinnen in de box en de bijhorende passages in de tekst.

Tot nu toe is er weinig maar veelbelovend onderzoek naar QuikScan gedaan. Er is nog veel behoefte om meer over deze nieuwe methode en de werking ervan te weten te komen. Het is dus nuttig om verder onderzoek uit te voeren om de kennis over QuikScan te verbreden.

QuikScan heeft als doel drie hoofdaspecten voor lezer te verbeteren: het begrijpen, op lange termijn onthouden en zoeken van informatie tijdens het lezen. In het onderzoek meten we het ontwikkelde tekstbegrip met een kennistest na afloop. In deze studie is ervoor gekozen om het begrijpen van een tekst verder te onderzoeken. Dit heeft verschillende redenen. Het

hoofddoel van het lezen van een tekst is het begrijpen van de informatie die een tekst bevat. Deze vaardigheid is beslist noodzakelijk. Als QuikScan een verbetering van het begrip kan bevorderen is dit een grote hulp. Als onderzoek bevestigt dat door QuikScan begrijpend lezen verbeterd kan worden, is dit een rede om QuikScan als waardevolle methode te accepteren. Bovendien is nog maar heel weinig onderzoek naar QuikScan gedaan en het is verstandig te beginnen bij het hoofddoel van het lezen van een tekst; namelijk het begrijpen ervan. Pas als dit bevestigd kan worden is onderzoek naar andere aspecten van QuikScan zinvol, zoals het zoeken van informatie en het op lange termijn onthouden van tekstinhoud.

Om de invloed van QuikScan op begrijpend lezen te onderzoeken zijn 40 psychologie studenten ingedeeld in twee condities. De proefpersonen krijgen allemaal dezelfde tekst te lezen, maar de condities verschillen in de bewerking van de tekst: In de ene versie is de tekst met QuikScan bewerkt en in de andere versie staat boven de tekst een ‘structured abstract’ volgens de methode van Hartley (2004).

Omdat er verschillende vormen van QuikScan bestaan moest een keuze gemaakt worden van de meest geschikte vorm voor het experiment. Er is voor gekozen om het design van QuikScan niet te complex te maken. Daarom loopt QuikScan als ‘floating summary’ door de tekst. Voor deze vorm is gekozen omdat de belangrijkste aspecten gebruikt worden, namelijk de samenvatting boven de tekst met nummering. Tegelijkertijd is de floating summary makkelijk te begrijpen en eist geen eerdere ervaring met QuikScan of een lange uitleg. Daarmee was deze vorm ideaal voor gebruik in het experiment.

De tekst wordt op papier gepresenteerd om zo de conditie te simuleren waarin studenten hun studieteksten lezen. Studenten moeten vaak wetenschappelijke teksten lezen In deze teksten is vaak een samenvatting aan het begin te vinden, die ‘abstract’ genoemd wordt. Deze vorm van ondersteuning voor tekstbegrip is ideaal om met QuikScan te vergelijken. Uit onderzoek van Hartley (2004) blijkt dat de ‘structured abstract’ een bijzonder effectieve vorm van samenvatting biedt.

Er zijn twee verschillende kanten aan QuikScan. Ten eerste de functionele kant; het ontwerp. Ten tweede is er ook de psychologische kant die ernaar kijkt hoe mensen met het ontwerp omgaan. Zhou (2008) heeft in zijn dissertatie hoofdzakelijk de functionele kant benaderd. In

zijn onderzoek bleek dat het design van QuikScan helpt. Maar er is nog niet duidelijk achterhaald waarom juist dit speciale design helpt. Welke cognitieve processen daarbij een rol spelen blijft open. Om deze open vragen te kunnen beantwoorden word in deze studie op de psychologische kant van QuikScan ingegaan.

Tot zover het algemene kader van de studie. Nu volgt eerst een bespreking van het theoretisch kader van QuikScan. Aan de hand van daarvan worden hypothesen opgesteld en daarna worden de methode en de resultaten presenteert. In de daarop volgende discussie worden de uitkomsten in een bredere context bezien. Geëindigd wordt met een conclusie.

2. Theorie achter het design van QuikScan

QuikScan is bedoeld om lezers teksten beter te laten begrijpen, de inhoud ervan langer te onthouden en sneller informatie in teksten te kunnen vinden. Een eerste onderzoek naar QuikScan heeft aangetoond dat het daadwerkelijk helpt om teksten beter te begrijpen (Zhou, 2008). Maar wat zijn de redenen dat QuikScan deze werking heeft? In deze sectie wordt nagegaan welke achterliggende psychologische theorieën het succes van QuikScan kunnen verklaren.

Om de werking van QuikScan te kunnen verklaren moet naar de centrale vraag "Hoe verwerken mensen tekst bij het begrijpend lezen?" worden gekeken. Om deze vraag te kunnen beantwoorden wordt allereerst gekeken wat begrijpend lezen is en welke activiteiten het inhoudt. De drie hoofdactiviteiten, aandacht, activeren van voorkennis en opbouw van schema's, worden nader toegelicht in een kort overzicht van relevante literatuur. Verder worden de problemen vastgesteld die bij deze activiteiten kunnen optreden. Dan worden methoden en theorieën, zoals de Cognitive Load Theory voor schema opbouw, beschreven die de activiteiten ondersteunen en die kunnen helpen de problemen op te lossen.

<u>Begrijpend lezen</u>

Zoals eerder genoemd zijn de kerncomponenten van QuikScan begrijpen, onthouden en zoeken. In het experiment wordt in het bijzonder het begrijpen benaderd omdat dit een voorwaarde is voor het onthouden van en het zoeken naar informatie in een tekst.

Met begrijpend lezen wordt hier bedoeld dat iemand de feiten van een tekst juist kan weergeven. Op een dieper niveau wordt tekstbegrip als de constructie van een multiple, complexe mentale representatie door de lezer gezien (Graesser, Millis, & Zwaan, 1997). De lezer moeten de hoofdpunten van de tekst en hun relatie onderling, dus de tekststructuur, representeren (Lorch & Lorch, 1985). Bij de overgang van het ene onderwerp na het volgende moet de lezer omgaan met een hoge verwerkingsbelasting (Lorch & van den Broek, 1997).

Begrijpend lezen kan worden ingedeeld in drie hoofdactiviteiten; aandacht, activeren van voorkennis en de opbouw van een schema. Figuur 1 laat zien welke methoden deze activiteiten ondersteunen.

Figuur 1: activiteiten van begrijpend lezen met ondersteunende methoden

Activiteit	Aandacht	Activeren van voorkennis	Opbouw schema
Ondersteunende Methode	Kopjes Abstracts	Organizers	Kopjes

<u>Aandacht</u>

Bij het lezen van een tekst is aandacht nodig om de tekst te kunnen lezen en begrijpen (Van Dijk & Kintsch, 1983). De aandacht moet erop gericht zijn bela ngrijke punten uit een tekst te halen. Maar dat lukt niet altijd. Mensen hebben vaak moeite de structuur uit een tekst te halen. Er zijn twee methoden die helpen om dit probleem te voorkomen.

Eén hulpmiddel om lezers te ondersteunen de aandacht doelgericht te sturen zijn kopjes. Deze brengen een externe structuur aan voor een tekst, waardoor lezers niet zelf een interne structuur hoeven op te bouwen. Onderzoek toont aan dat kopjes bij het verwerken van een tekst helpen. Een voorbeeld hiervan is het onderzoek van Hyönä en Lorch (2004).

Hyönä en Lorch (2004) lieten in hun onderzoek deelnemers twee teksten lezen. In de ene tekst werd de wisseling van onderwerp door kopjes aangegeven en in de andere tekst niet. Het gebruik van kopjes bleek het verwerken van de tekst te vereenvoudigen. Aan de hand van een samenvatting van de tekst die na het lezen door de proefpersonen geschreven moest worden was te zien dat mensen zich meer konden herinneren als ze de tekst met kopjes gelezen hadden. Deze proefpersonen konden namelijk meer onderwerpen uit te tekst opnoemen dan den mensen die de tekst zonder kopjes gelezen hadden.

Lezers kunnen een tekst met kopjes beter begrijpen en onthouden meer informatie doordat de kopjes ervoor zorgen dat de aandacht selectief op de kernconcepten wordt gericht. De kopjes identificeren kernconcepten die op hun beurt dienen als mentaal frame of kapstok voor de (structuur van) de gehele tekst

Kopjes dienen ook als 'anchor' voor het verder begrijpen van een tekst. Als er vooraf het lezen door een kopje al informatie gegeven is, wordt de daarop volgende tekst in de zin van de kopje geïnterpreteerd. De lezer weet waarover de volgende informatie gaat en de kans op misinterpretatie wordt kleiner.

Een ander hulpmiddel om de aandacht van mensen te sturen zijn abstracts. Een abstract is een korte samenvatting van een artikel. Door het lezen van een abstract kan men in korte tijd een goed beeld van de inhoud van het artikel krijgen. Een gestructureerde abstract verschilt van de traditionele abstract omdat het opgedeeld is in verschillende secties met ondertitels, meestal bestaand uit introductie, methoden, uitkomsten en discussie.

Hartley (2004) heeft veel onderzoek naar gestructureerde samenvattingen (stuctured abstacts) gedaan. Zijn studies laten zien dat gestructureerde abstracts beter dan traditionele zijn omdat ze meer informatie bevatten, een hogere kwaliteit hebben en beter leesbaar zijn. Een voordeel van deze abstracts is tevens dat het formaat consistent is met de tekst. De indeling komt overeen met die van het artikel en daarom is de informatie beter toegankelijk. Bovendien wordt het zoeken in het artikel vergemakkelijkt.

QuikScan gebruikt deze structurerende werking van kopjes en gestructureerde abstracts in een gemodificeerde vorm. In het design van QuikScan worden beide methoden gecombineerd. In principe worden 'uitgebreide kopjes' of 'beperkte abstracts' benut omdat de voorafgaande samenvattingen in QuikScan ook de hoofdpunten weergeven en orde in de tekst aanbrengen. De achterliggende idee is dat samenvattende QuikScan zinnen net als kopjes een functie als anchor aannemen en de tekst net als abstracts structureren doordat de indeling overeenkomt met de tekst.

Het nieuwe aan QuikScan is dat de samenvattingen in boxen tussen de hele tekst staan en dat een nummer voor elke samenvattende zin verwijst naar de corresponderende sectie in de tekst. De nummering in QuikScan lijkt dezelfde functie te vervullen als de structuur in een gestructureerde abstract. Omdat de nummering expliciet de verbinding met de tekst aangeeft kan het de aandacht van de lezer sturen naar de belangrijke punten in ene tekst.

Activeren van voorkennis

Een van de belangrijkste cognitieve strategieën voor begrijpend lezen is het activeren van voorkennis (Dole, Valencia, Greer, & Wardrop, 1991). Om een tekst te kunnen begrijpen moet de lezer zijn eigen kennis activeren om de nieuwe informatie daaraan te kunnen koppelen. Dit gaat niet altijd automatisch en daarom lukt het lezers vaak niet een tekst met onbekende informatie met al bestaande kennis te verbinden en de tekst zo een zin te geven.

Een theorie die dit probleem probeert te voorkomen door de rol van voorkennis te benadrukken gaat over ‘advance organizers’ (Ausubel, 1960). Onderzoek heeft aangetoond dat organizers helpen om begrijpen en onthouden te verbeteren (Mayer, 2003). Met een organizer wordt nieuw materiaal geïntroduceerd en samengevat (Woolfolk, 2001). De methode overbrugt en verbindt oude informatie met iets nieuws.

Er zijn twee verschillende typen van advance organizers. Organizers die ertoe dienen om kennis voor de lezer bereikbaar te maken door nieuwe informatie te geven worden “expository organizers” genoemd. “Comparative organizers” zijn organizers die helpen om externe connecties te maken met al bestaande kennis die relevant is voor de opname en het verwerken van nieuwe informatie. Dat wordt gedaan door de lezer aan bestaande kennis te herinneren (Mayer, 2003).

Door informatie in vorm van organizers voorafgaand aan het te lerende materiaal te presenteren kan de student de nieuwe informatie beter organiseren en interpreteren. Organizers werken het best als er geen specifieke voorafgaande kennis (‘prior knowledge’) bij betrokkenen is omdat de organizer zelf de voorafgaande kennis wordt voordat het nieuwe materiaal geleerd wordt. Mayer (2003) schrijft "the effects of advance organizers should be most visible for tests that involve […] transfer to new situations, because the

advance organizer allows the learner to organize the material into a familiar structure". Dat betekent voor QuikScan dat het dan het zinvolste is een tekst te bewerken als het domein bekend is, maar de informatie in de tekst nieuw en onbekend is. In deze studie is er daarom voor gekozen de psychologie studenten een tekst over een psychologisch onderwerp te geven, maar deze betrekking te laten hebben op een voor hen relatief onbekend thema.

Opbouw schema: Cognitive Load Theory

Een andere belangrijke theorie voor QuikScan is Sweller's 'Cognitive Load Theory' (CLT), die er van uitgaat dat leren met cognitieve belasting verbonden is en tot doel heeft de presentatie van informatie vorm te geven zo dat mensen optimaal kunnen leren (Sweller, van Merriënboer, and Paas, 1998). Deze door 'information processing theory' beïnvloedde theorie benadrukt de rol van het werkgeheugen tijdens het leren. Er wordt ervan uitgegaan dat de capaciteit van het werkgeheugen gelimiteerd is en slechts een deel informatie opgeslagen kan worden.

De CLT gaat ervan uit dat kennis in schema's wordt opgeslagen. Tijdens het leren worden nieuwe schema's construeert en nieuwe kennis met al bestaande schema's verbonden. Om leren mogelijk te maken is het belangrijk dat het werkgeheugen genoeg capaciteit heeft en cognitief niet overbelast wordt. De CLT wordt ingezet om instructie (materiaal) te verbeteren.

De CLT heeft een informatieve waarde voor QuikScan omdat met hulp van deze theorie gekeken kan worden of de bijkomende samenvattende zinnen de lezer ontlasten of belasten. Bij QuikScan wordt ervan uitgegaan dat de samenvattende zinnen een hulp zijn omdat de lezer hierdoor de kernconcepten van de tekst te zien krijgt. Maar het zou ook kunnen zijn dat deze bijgevoegde zinnen voor de lezer een extra belasting zijn omdat daardoor voor het werkgeheugen een overbelasting ontstaat. In het experiment wordt geprobeerd te achterhalen in hoeverre QuikScan de cognitieve belasting verhoogt of verlaagd.

3. Onderzoeksvragen en hypothesen

De hoofdvraag in deze studie is of het gebruik van QuikScan een toevoegende waarde voor de lezer heeft. De vraag “Kan de lezer met QuikScan bewerkte teksten beter begrijpen en onthouden?” is door Zhou (2008) al met een ‘ja ‘ beantwoord. Maar er moet vervolgonderzoek gedaan worden om dit resultaat te kunnen herbevestigen en te zien of QuikScan ook in een ander context dan in het experimentele opzet van Zhou (2008) werkt. Daarom wordt in dit onderzoek ernaar gekeken of de gunstige invloed van QuikScan op begrijpen en onthouden ook in andere omstandigheden optreed.

Met andere omstandigheden worden vier aspecten bedoeld. Ten eerste wordt het experiment in een ander land dan de VS uitgevoerd, namelijk Nederland. Ten tweede wordt een andere tekst genomen. Ten derde wordt QuikScan met een andere controle conditie vergeleken. De conditie in het experiment is geen onbewerkte tekst maar een tekst met een gestructureerde abstract. Ten vierde gaat de tekst niet over een onderwerp waarvan de proefpersonen niets afweten maar over een onderwerp uit de studie van de proefpersonen. Voor deze aanpak is gekozen omdat in de realiteit mensen in een bepaald studie of vakgebied meestal teksten moeten lezen die van belang zijn voor hun studie. De proefpersonen zijn psychologie studenten en deze besteden het grootste deel van hun studietijd aan het lezen van teksten over psychologische onderwerpen. Om desniettemin te voorkomen dat voorkennis voor betere testscores zorgt gaat de tekst over een onderwerp dat nooit eerder in de studie aan bod is gekomen.

Hypothese 1: QuikScan bevordert tekstbegrip.

Tekstbegrip wordt gemeten met een kennistoets na afloop. Omdat de leestijd hierop van invloed zou kunnen zijn wordt deze geregistreerd om te zien of condities hierop verschillen.

Hypothese 2: Teksten met QuikScan worden hoger gewaardeerd.

Om een antwoord te verkrijgen op de tweede hypothese bestuderen we de tekstwaardering op drie punten: (a) interesse, (b) begrijpelijkheid en (c) structuur.

4. Methode

4.1 Proefpersonen

De 40 proefpersonen waren Psychologie studenten van de Universiteit Twente. Er deden studenten uit alle vijf studiejaren mee. Gemiddeld had men 2 studiejaren achter de rug. De deelnemers waren tussen 18 en 29 jaar en gemiddeld 21,6 jaar oud. Van de deelnemers waren 28 vrouwen en 12 mannen. Er was een verschil in de moedertaal van de proefpersonen. Er hebben zowel Nederlandse als Duitse studenten, die aan de Universiteit Twente studeren, aan het experiment deel genomen. De Duitse studenten moeten voor ze in Nederland mogen studeren de NT2 test halen, die moedertaalniveau eist. Ze spreken dus goed Nederlands. Er waren 17 Nederlandse en 23 Duitse proefpersonen. Voor alle proefpersonen gold dat de tekst niet in hun moedertaal was, maar in het Engels. De proefpersonen werden random over de twee condities verdeeld.

Oorspronkelijk hebben 45 personen aan het experiment deelgenomen. Vijf mensen zijn niet in het dataset opgenomen omdat ze er langer over deden dan de maximale toegestane leestijd van 45 minuten.

4.2 Instrumenten

Alle Duitse deelnemers kregen de instructie, de vragenlijst over persoonlijke karakteristieken en de open vragen in het Duits en mochten de open vragen ook in het Duits beantwoorden. Alle instrumenten waren op papier.

Instructie. Voorafgaand aan het experiment kregen alle proefpersonen een identieke instructie te lezen. Hierop werd kort aangegeven dat de proefpersonen een tekst te lezen krijgen met een bepaalde vormgeving die bedoeld is om tekstbegrip te verbeteren. Ze kregen de instructie om de tekst zorgvuldig door te lezen, zonder aantekeningen te maken. Het werd aangekondigd dat ze na het lezen vragen moeten beantwoorden en daarbij geen toegang meer tot de tekst hebben. Verder werd gezegd dat ze maximaal 45 minuten tijd hebben om de tekst te lezen.

Tekst. Er was gekozen voor de Engelse tekst '"Hearing the News" versus "Being There", Comparing flashbulb memories and recall of first-hand experiences' (Pillemer, 2009). Deze tekst is het complete zesde hoofdstuk uit het boek "Flashbulb memories, New Issues and New Perspectives"(Luminet and Curci, 2009). De tekst was op kleine punten aangepast. Zo was de inleiding verkort door de cases aan het begin weg te laten. Ook de samenvatting aan het eind van de tekst was weggelaten omdat QuikScan en de gestructureerde abstract als samenvatting ingezet worden en een verdere samenvatting daarmee zou kunnen interfereren.

De tekst gaat over een relatief onbekend onderwerp dat nooit in de studie werd behandeld. De tekst heeft een gemiddelde moeilijkheidsniveau.

Er zijn twee versies van de tekst gemaakt. Voor de experimentele groep is de tekst door de ontwikkelaars van QuikScan met QuikScan summaries voorzien. Hiervoor zijn 'floating summaries' gebruikt, die door de hele tekst lopen. In Figuur 2 is een voorbeeld van een QuikScan-box met bijhorende tekst te zien. De samenvattende zinnen staan in een grijze box en zijn van een nummer voorzien. In de tekst is dit nummer terug te vinden en geeft aan welke deel in de tekst door welke QuikScan-zin samengevat wordt.

Figuur 2. Voorbeeld van een QuikScan samenvatting met tekst

1} Brown and Kulik first defined Flashbulb memories (FBMs) as memories of our personal circumstances when first hearing of a very surprising and consequential event.

2} They distinguished FBMs of dramatic public events and FBMs of momentous personal events, such as the death of a parent.

{ 1 Brown and Kulik (1977) first defined flashbulb memories (FBMs) as “memories for the circumstances in which one first learned of a very surprising and consequential (or emotionally arousing) event", and offered the assassination of President John Kennedy as the "prototype case" (p. 73).

{ 2 Brown and Kulik (1977) also examined memories of first learning of a "personal, unexpected shock" (p. 79), what could be termed *FBMs of personal events.* Brown and Kulik's instructions to participants guided recall to moments when significant personal news was received, and by far the most common memory theme was learning about the death of a parent.

Bij de controlegroep was de tekst onder de opschrift voorzien met een gestructureerde abstract. Deze staat net als de QuikScan-boxen in een grijze box. Voor deze opvallende vorm is gekozen om de mensen in de controlegroep te laten denken dat ze in de experimentele groep zitten om uit te sluiten dat deelnemers mee moeite doen, omdat ze weten dat ze in de experimentele groep zitten of minder moeite doen omdat ze door hebben dat ze in de controle groep ingedeeld zijn. In Figuur 3 is de gestructureerde abstract te zien, die voor het onderzoek is gebruikt.

Figuur 3. De structured abstract voor de onderzochte tekst

Background: Flashbulb memories (FBMs) are memories of our personal circumstances when first hearing of a very surprising and consequential event. They are seen as engaging and provocative.

Aim: The text explains the popularity of FBM studies and further aims to call into question the assumption that FBMs and first-hand experiences have similar underlying memory processes.

Method: Narrative literature review.

Results: Dissimilarities between FBMs of public events and traumatic first-hand experiences lie in the greater consequentiality of momentous personal experiences and in the existence of a thematic relationship between the circumstances and the personal experience. Global comparisons between memories have questionable validity because indices of quality (e.g., consistency) and of predictor variables (e.g., rehearsal) vary considerably across studies. In direct comparisons between memory events, different techniques and methods have been employed. These studies show the role of type of participation and rehearsal of the event on retention.

Conclusion: The distinction between FBMs of newsworthy public events and of momentous first-hand experiences appears to be meaningful on both conceptual and empirical grounds.

De tekst met de gestructureerde abstract liep over 11 pagina's en had 5842 woorden. De abstract bevatte 170 woorden. De QuikScan tekst was 13 pagina's lang en bevatte 6475 woorden. In de tekst waren er in het geheel negen QuikScan boxen met in totaal 33 samenvattende zinnen. Alle QuikScan boxen tezamen bevatten 802 woorden.

Vragenlijst over persoonlijke karakteristieken: De vragenlijst over persoonlijke karakteristieken vroeg naar algemene data zoals naam, geslacht, leeftijd, moedertaal, studiejaar, inschatting van eigen vaardigheid in Engels en inschatting van de groep waar iemand zich in het experiment dacht te zitten. De proefpersonen moesten een vraag beantwoorden door een kruis te zetten bij één van de antwoordmogelijkheden.

Vragenlijst over tekstperceptie: De vragenlijst over de perceptie van de proefpersonen over de tekst is opgesteld in de vorm van stellingen (bijvoorbeeld “Ik vond de tekst interessant.”). De proefpersonen werden gevraagd aan te geven in hoeverre ze het eens waren met de stellingen door één kruis te zetten op een 7-punts Likert schaal. De antwoordmogelijkheden waren ‘Helemaal mee oneens’, ‘Mee oneens’, ‘Een beetje oneens’, ‘Neutraal’, ‘Een beetje mee eens’, ‘Mee eens’ en ‘Helemaal mee eens’.
Deze vragenlijst was alleen maar in het Nederlands omdat het vertalen naar het Duits niet letterlijk mogelijk was en de subtiele verschillen mogelijk tot een verschil in de antwoorden gevoerd zouden kunnen hebben. De vragenlijst bestond uit 18 vragen over interesse voor de tekst en het onderwerp van de tekst, begrijpelijkheid van de tekst en de mening over de structuur van het document. De betrouwbaarheid voor deze concepten was adequaat; Cronbach’s Alpha voor interesse is 0,827, voor begrijpelijkheid 0,873 en voor structuur 0,904.

Test items. Tekstbegrip werd door 12 open vragen getoetst. De vragen hebben gemeten hoeveel de proefpersonen van de tekst hebben begrepen en onthouden. De antwoorden mochten in de moedertaal (Nederlands of Duits) worden geschreven en het gebruiken van Engelse termen was toegestaan. Na elke vraag was aangegeven hoeveel punten bij deze vraag gehaald kunnen worden. De vragen werden met een antwoordsleutel gescoord. De vragen vroegen naar dingen die zowel in de QuikScan samenvatting als ook in de gestructureerde abstract stonden en naar details die in geen samenvatting te vinden waren.
Bij één vraag konden minimaal 0,1 en maximaal 4 punten gehaald worden. In het geheel konden er maximaal 25 punten gehaald worden.

4.3 Procedure

Studenten schreven zich in via het universitaire proefpersonensysteem en kregen één credit of € 6 voor hun deelname. Er konden tot en met vier proefpersonen gelijktijdig aan het experiment deelnemen. Elke proefpersoon kreeg eerst de instructie te lezen en begon daarna aan de tekst. Tijdens het lezen was het niet toegestaan aantekeningen te maken. De maximale leestijd was 45 minuten. Na het lezen hadden de proefpersonen geen toegang meer tot de tekst.

Na het lezen van de tekst vulden de deelnemers eerst de vragenlijst over persoonlijke karakteristieken en dan over hun tekstperceptie in. Daarna moesten ze 12 open vragen over de inhoud van de tekst beantwoorden. Iedereen voltooide de studie binnen een totale tijd van 60 minuten.

4.4 Data analyse

De studie was experimenteel opgezet met een experimentele en een controlegroep. Mogelijke verschillen tussen de twee groepen zijn gemeten met ANOVAs. Het verwerpingniveau was bepaald op een α van 0.05 voor alle statistische toetsen.

5. Resultaten

5.1 Bevordert QuikScan het tekstbegrip?

Op de kennistest is het gemiddelde van de controle groep 6,79 en van de experimentele groep 9,58 punten. Proefpersonen in de experimentele conditie scoorden significant hoger op de test dan proefpersonen in de controle conditie ($F(1,123) = 23{,}308$, $p < 0{,}001$). De score op Cohen's (1988) d-maat voor effect grootte laat zien dat deze (zeer) hoog is, $d = -1{,}5267$.

Analyses van de leestijd lieten zien dat de proefpersonen in beide condities nagenoeg evenveel tijd nodig hadden om de tekst te lezen. In de controle conditie deed men gemiddeld 36 minuten over de tekst, in de experimentele conditie was dat 37 minuten, $F < 1$.

5.2 Beoordeling van Interesse, Begrijpelijkheid en Structuur

Er is geen statistisch significant verschil tussen de twee condities gevonden bij de beoordeling van interesse, begrijpelijkheid en structuur van de tekst. De proefpersonen beoordeelden de tekst op alle drie constructen bovengemiddeld gunstig. Het gemiddelde van interesse is 4,429, van begrijpelijkheid 4,470 en van structuur 4,525 op een 7-punts Likert schaal. De proefpersonen in de experimentele conditie beoordeelden alle drie constructen beter, maar het verschil met de controle conditie was niet statistisch significant , voor interesse $F(1,39) = 0{,}249$, $p = 0{,}621$, voor begrijpelijkheid $F(1,39) = 1{,}314$, $p = 0{,}259$ en voor structuur $F(1,39) = 0{,}193$, $p = 0{,}663$.

6. Discussie

De hypothese dat QuikScan een positieve invloed op tekstbegrip heeft kan worden bevestigd. Deze uitkomst heeft verschillende implicaties. Het betekend dat de manier waarop de meeste teksten nu worden gestructureerd niet ideaal is. Als er zo een groot verschil tussen de veel gebruikte abstracts en QuikScan is kan dat betekenen dat abstracts, zelf als ze gestructureerd zijn, tekstbegrip lang niet zo goed ondersteunen als mogelijk.

De consequentie hiervan is dat er de mogelijkheid is om mensen te helpen teksten veel beter te verwerken. Als QuikScan wordt gebruikt bij relatief lange studieteksten (zoals hoofdstukken in een boek) kan dat voor lezers een groot voordeel zijn. Lezen is een van de meest gebruikte activiteit waarmee mensen kennis verwerven. Als lezen dus op deze blijkbaar zo effectieve manier kan worden ondersteund zou dat veel tijd en energie voor iedereen die voor zijn werk of studie moet lezen kunnen besparen.

De resultaten lijken intern valide te zijn. Voor de student als lezer is er ook een externe validiteit gegeven. Maar het is niet zeker dat oudere mensen of mensen die voor hun baan moeten lezen hetzelfde profijt uit QuikScan kunnen trekken. Studenten zijn wel gewend voor hun studie te lezen. Het is niet zeker of bij mensen die minder vaak lezen dezelfde effect optreed. Tevens is ook niet gegarandeerd dat het effect in dezelfde mate optreedt als QuikScan voor heel makkelijke teksten gebruikt wordt. De externe validiteit is dus minder sterk dan de interne validiteit van dit onderzoek. Daarom zou het interessant zijn voor vervolgonderzoek een andere doelgroep te onderzoeken, zoals beginnende lezers of academische lezers.

Er zijn overeenkomsten maar ook verschillen tussen de gevonden resultaten in deze studie en die van Zhou (2008). Een belangrijk verschil in opzet is dat de proefpersonen in Zhou's experimenten een multiple-choice toets moesten beantwoorden en in deze studie open kennisvragen kregen. In Zhou's experiment moesten de feiten uit de tekst slechts herkend worden terwijl in deze studie de feiten zonder hulp herinnerd moesten worden. Dat de resultaten nog steeds significant zijn laat zien dat QuikScan niet alleen 'recogniton' maar ook 'retrieval' bevorderd.

Een ander belangrijk verschil was de taal. In Zhou's experiment lazen de deelnemers een tekst in hun moedertaal, terwijl de deelnemers van deze studie de tekst niet in hun moedertaal lazen.

De tweede hypothese kon, anders als bij Zhou (2008) niet worden bevestigt. Maar als je naar de implicatie ervan kijkt kan deze resultaat ook als bevestiging van de werking van QuikScan gezien worden. Als de mensen in de QuikScan conditie de tekst net zo interessant, begrijpelijk en goed gestructureerd vonden als de mensen in de controle groep betekend dit dat het effect niet van de tekstperceptie afhangt. QuikScan werkt onafhankelijk van hoe leuk iemand een tekst vindt een motivatie speelt geen rol.

Het zou interessant zijn om in vervolgonderzoek te kunnen werken met een tweede controlegroep die de onbewerkte tekst te lezen krijgt. Interessant is ook de mogelijkheid om allen QuikScan zinnen ten nemen die identiek zijn aan de zinnen uit de tekst. In het experiment waren de zinnen bewerkt. Als je alleen maar zinnen uit de tekst neemt kan je zeker ervan zijn dat het effect van QuikScan niet afhangt van de kwaliteit van de persoon die de QuikScan maakt.

Verder zou het voor vervolgonderzoek interessant zijn om te kijken of er verschil is als de tekst op een computer wordt gelezen. Een andere belangrijke variatie ligt in het toestaan van het maken van aantekeningen. Proefpersonen mochten nu geen aantekeningen maken omdat deze als externe ondersteuning de invloed van QuikScan zouden kunnen verminderen. In de werkelijkheid staat het lezers natuurlijk vrij om tekstbegrip te ontwikkelen via het maken van aantekeningen in of naast de tekst.

Als je naar de Cognitieve Load Theory terugkijkt lijkt QuikScan de lezer niet te belasten maar voeren de samenvattingen in tegendeel tot een ontlasting van het werkgeheugen.

Men kan dus zeggen dat de bijzonder aanzienlijke aanwinst door QuikScan tot een nuttige toepassing kan leiden.

7. Conclusie

Samengevat laat dit onderzoek zien dat QuikScan begrijpend lezen positief beïnvloedt, zonder de leesproces te verlengen. QuikScan zorgt er echter niet voor dat teksten hoger gewaardeerd worden voor interesse, begrijpelijkheid en structuur.

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Appendix

Appendix A: Text op Proefpersonenpool GW Universiteit Twente

Study Information	
Study Name	Begrijpend lezen
Abstract	Via dit experiment wordt gekeken welke factoren tekstbegrip beïnvloeden
Eligibility Requirements	Psychologie studenten met beheersing van de Engelse taal (deelname door Duitse studenten geen probleem)
Prescreen Restrictions	No Restrictions - [View/Modify Restrictions]
Duration	60 minutes
Credits	1 Credits
Researcher	Laura Weiss
Participant Sign-Up Deadline	24 hours before the study is to occur
Study Status	Visible to participants (approved) Active study (appears on list of available studies)
IRB Approval Code	09036 (expires 20 June 2009)

Appendix B: Instructie

Instructie

Welkom bij dit experiment. Alvast bedankt voor je deelname.

Je gaat in dit onderzoek een tekst lezen die op de volgende pagina begint. De tekst heeft een bepaalde vormgeving die bedoeld is om tekstbegrip te verbeteren.

Lees de tekst zorgvuldig door. Je mag geen aantekeningen maken en niet met de andere deelnemers communiceren. Als je vragen hebt, vraag de proefleider.

Na afloop worden een aantal vragen gesteld over wat je onthouden hebt van de inhoud van de tekst. Het is belangrijk dat je deze zo goed mogelijk beantwoordt. Bij de beantwoording van de vragen heb je geen toegang meer tot de tekst.

Je hebt maximaal 45 minuten de tijd om de tekst te lezen. Geef alsjeblieft de proefleider een signaal zodra je klaar bent. Je leest de tekst waarschijnlijk in een groep met andere deelnemers. Iedereen heeft een ander document, daarom kan het zijn dat anderen meer of minder tijd nodig hebben. Trek je daar dus niets van aan.

Ga nu alsjeblieft na de volgende pagina en begin met het lezen van de tekst.

Appendix C: Instructie Duitse versie

Instruktion

Willkommen bei diesem Experiment. Danke, dass du teilnimmst!

In diesem Experiment liest du einen Text, der auf der folgenden Seite beginnt. Der Text hat eine bestimmte Formgebung, die Textverständnis verbessern soll.

Les den Text bitte einmal sorgfältig durch. Mach dir bitte keine Aufzeichnungen und kommuniziere nicht mit den anderen Teilnehmern. Wenn du Fragen hast, wende dich an den Testleiter.

Danach werden einige Fragen über den Inhalt des Textes gestellt. Es ist wichtig, dass du diese so gut wie möglich beantwortest. Während des Beantwortens der Fragen hast du keine Zugriff mehr auf den Text.

Für das Lesen hast du maximal 45 Minuten Zeit. Ruf bitte den Testleiter sobald du fertig bist. Du wirst den Text eventuell in einer Gruppe mit anderen Teilnehmern lesen. Jeder hat ein anderes Dokument, deshalb kann es sein, dass andere mehr oder weniger Zeit benötigen. Kümmere dich nicht darum.

Du kannst jetzt anfangen den Text zu lesen.

Appendix D: QuikScan tekst

"Hearing the News" versus "Being There"

David B. Pillemer

1} Brown and Kulik first defined Flashbulb memories (FBMs) as memories of our personal circumstances when first hearing of a very surprising and consequential event.

2} They distinguished FBMs of dramatic public events and FBMs of momentous personal events, such as the death of a parent.

3} There are also memories of first-hand experiences, such as being involved in an automobile accident.

4} Brown and Kulik speculated that the same psychological mechanism accounts for memories of momentous public events and first-hand experiences.

5} FBMs of public events give insights about personal event memory, including the accuracy of eyewitness testimony.

6} I (David Pillemer) will review the key issues. This includes pointing out dissimilarities between FBMs of public events and memories of first-hand experiences.

{ 1 Brown and Kulik (1977) first defined flashbulb memories (FBMs) as "memories for the circumstances in which one first learned of a very surprising and consequential (or

emotionally arousing) event", and offered the assassination of President John Kennedy as the "prototype case" (p. 73).

Following Brown and Kulik, scores of researchers have examined *FBMs of public events,* including attacks on, deaths of, or resignations of world leaders (e.g., Christianson, 1989; Conway et al., 1994; Curci, Luminet, Finkenauer, & Gisle, 2001; Finkenauer, Luminet, Gisle, El-Ahmadi, van der Linden, & Philippot, 1998; Pillemer, 1984), World War II events (Berntsen & Thomsen, 2005), the 1986 explosion of the space shuttle *Challenger* (Bohannon, 1988; McCloskey, Wible, & Cohen, 1988; Neisser & Harsch, 1992), the 1989 California earthquake (Neisser, Winograd, Bergman, Schreiber, Palmer, & Weldon, 1996), and the September 11 attacks on the World Trade Center in 2001 (e.g., Curci & Luminet, 2006; Talarico & Rubin, 2003). This list represents only a fraction of the total number of studies on similar topics.

{ 2 Brown and Kulik (1977) also examined memories of first learning of a "personal, unexpected shock" (p. 79), what could be termed *FBMs of personal events.* Brown and Kulik's instructions to participants guided recall to moments when significant personal news was received, and by far the most common memory theme was learning about the death of a parent. Studies of remembering one's own life circumstances when receiving important private news are rare. With only a few exceptions (e.g., receiving notification of college admission; Tekcan, 2001), the FBM literature is dominated by large scale surveys of newsworthy public events.

{ 3 Memories that represent circumstances in which one is an active participant rather than a passive recipient could be termed *memories of first-hand experience.* Because first-hand experiences are so diverse and ubiquitous—including car accidents, trauma, birthday celebrations, the first kiss, and scoring the winning goal—there appears to be little added value in using the targeted term "FBM" to describe them.

{ 4 Brown and Kulik (1977, p. 99) speculated that properties of FBMs also characterize recall when the target event is a first-hand personal experience: 'Probably the same 'Now Print!' mechanism accounts both for the enduring significant memories in which one has played the role of central character and those in which one has only been a member of an interested audience of millions." Their speculation about similar underlying memory processes deserves more close and careful scrutiny. { 5 Brown and Kulik's original study of FBMs has inspired books (Conway, 1995; Winograd & Neisser, 1992) and dozens of journal articles. The goal of this work is not simply to examine memories of hearing about the occasional public tragedy. Rather, the purpose is to enrich our understanding of personal event memory, including highly emotional and tragic events that happen to us directly. For example, studies of FBMs have contributed to the debate about the accuracy of eyewitness testimony (e.g., Ceci & Bruck, 1993). Do FBMs of public events provide a useful and valid model of memories of events that happen to us directly, when we are central players?

{ 6 In this chapter I first identify reasons why FBMs of public events, which occur so rarely over the course of one's life, generate such intense scientific interest. Second, I outline potential dissimilarities between FBMs and memories of first-hand experience. Third, I question the validity of global comparisons between these two memory types. Fourth, I describe and evaluate a small set of carefully designed research studies that directly compare memories of news reception events and first-hand experiences.

WHY ARE FBM STUDIES SO POPULAR?

7} **Brown and Kulik presented FBMs as engaging and provocative phenomena.**

8} One reason why FBM studies are prevalent is that researchers can easily find many subjects with FBM memories of major public events.

9} In addition, psychologists who study memory have long focused on accuracy of recall.

10} Brown and Kulik suggest that FBM memory is extraordinarily powerful and unchanging, but their underlying model clearly predicts variations, partly as a result of retellings of the event.

{ 7 Brown and Kulik's (1977) original presentation of FBM was engaging and provocative. They presented a phenomenon that all readers could readily identify in their own personal experience, yet they emphasized its unusual nature: "It is not the memory of the tragic news that invites inquiry, but the memory of one's own circumstances of first hearing the news. There is no obvious utility in such memories" (p. 74). Brown remembered being on the phone with the dean's secretary at Harvard University when he learned that Kennedy had been shot, but his personal circumstances were unrelated to the public news event. Brown and Kulik noted that "there is something strange about this recall" (p. 74), and described their research endeavor as being "on the trail of a mystery" (p. 98).

Although FBMs may be unusual, they are universally recognized. Academic psychologists know that introducing this topic to students, colleagues, or friends invariably triggers a stream of personal testimonials. The concept is so ubiquitous that Gary Larson parodied it in a cartoon with the caption "More facts of nature: All forest animals, to this very day, remember exactly where they were and what they were doing when they heard that Bambi's mother had been shot." In the cartoon, a possum was 'just getting ready to cross the interstate". In short, Brown and Kulik identified a phenomenon that was at the same time common knowledge, compellingly curious, and lacking any scientific explanation—favourable conditions for inspiring empirical study.

{ 8 FBMs are an especially attractive research topic for several reasons. Almost everyone is familiar with the concept and is able to produce a memory on demand, so that potential research participants are plentiful. Following an event like the 2001 attack on the World Trade Center, there is a ready pool of people who have received news of the same public trauma at about the same time. The methodology is straightforward— all that is required is a well constructed questionnaire and a willing group of respondents. The set of target events is always expanding— every new public shock or tragedy provides a unique opportunity to test existing hypotheses. In contrast, it is more challenging to conduct large-scale surveys of the “sundry private shocks in each person's life", because of the "absence of a very large population of like-minded people" (Brown & Kulik, 1977, p. 75).

{ 9 An additional reason why FBM studies are so popular is the intense, almost single-minded scientific interest in the issue of recall accuracy as opposed to other memory functions. Brown and Kulik's provocative title *Flashbulb Memories* and flowery rhetoric suggested the existence of an extraordinarily powerful and unique memory mechanism. They described circumstances under which the "central nervous system will 'take a picture’” (p. 84), and referred to the underlying FBM as "unchanging as the slumbering Rhinegold" (p. 86). **{ 10** If one looks beyond the rhetoric, Brown and Kulik's theoretical model clearly predicts variations in narrative memory elaboration, partly as a result of constructive processes accompanying retellings (Pillemer, 1990). Nevertheless, the strongest possible claims about FBMs— that they are unfailingly accurate, complete, and resistant to forgetting (e.g., McCloskey, Wible, & Cohen, 1988)—generated considerable controversy and strong motivation to conduct empirical tests as new public events presented themselves.

"HEARING THE NEWS" IS NOT THE SAME AS "BEING THERE"

11} Brown and Kulik proposed that FBMs originally held survival value, but present-day FBMs of public events hold no such value.

12} Brown and Kulik speculate that both hearing the news and first-hand experience employ the same memory mechanism, but one difference is the greater consequentiality of traumatic first-hand experiences.

13} Another reason we tend to remember personal circumstances of traumatic first-hand events is that these circumstances are thematically related to the event.

{ 11 Brown and Kulik (1977) proposed that FBMs of first learning about shocking public events reveal a general cognitive mechanism. The mechanism would have survival value because emotional and important events are frequently experienced directly. For first-hand experiences, the surrounding circumstances define the target event and provide important clues about how to respond to similar episodes in the future. Brown and Kulik speculated that for our distant ancestors the appearance of a new and dangerous carnivore would trigger a vivid memory because the correlated information—the precise location where the intruder was spotted, the ongoing activities that could have provoked an attack, and so on—has protective value. In contrast, present-day FBMs of first hearing about distant public events provide no such survival benefits, because the surrounding circumstances—where you were and what you were doing—are unrelated to the substance of the newsworthy occurrence. FBMs of public events simply reflect the automatic activation of a memory mechanism that evolved earlier, for different purposes.

{ 12 Although Brown and Kulik speculated that both hearing the news and first-hand experience are recorded by the same underlying memory mechanism, several dissimilarities

are apparent. Consequentiality (personal importance or life impact) of these two types of memory certainly differs in fundamental ways. People who experienced from a distance the resignation of Margaret Thatcher (Conway et al., 1994), the explosion of the space shuttle *Challenger* (Neisser & Harsch, 1992), or the attack on the World Trade Center (Talarico & Rubin, 2003) may rate these events as highly important on a seven-point scale presented in a memory questionnaire, but the perceived *personal* life impact must be of a different order than the shock of an unexpected death of a parent or spouse, a serious accident, or a crime victimization. As a citizen of the US it would be difficult to rate the *Challenger* explosion, the death of a president, or a terrorist attack as anything other than consequential, but its day-to-day life impact may pale in comparison to first-hand trauma. Shocking public news and traumatic first-hand experience are likely to be rated differently on Berntsen and Rubin's (2006) new Centrality of Event Scale, which includes items such as "I feel that this event has become a central part of my life story" and "This event permanently changed my life".

{ 13 A key difference between first-hand experience and hearing the news is that memories of personal circumstances are related thematically to the target event in the former case only: "Although the fact that an assassination or resignation has occurred may have real consequences for citizens of a given country… the *occasion on which they heard about* it surely does not" (Neisser et al., 1996, p. 353). When thinking or talking about the World Trade Center attacks, memories frequently centre on the newsworthy event itself; personal details come up only when attention is directed specifically to "hearing the news" stories. When thinking or talking about a life-threatening car accident, the personal details are the story (see Curci & Luminet, 2006; Curci, Chapter 1, this volume; and Hirst & Meksin, Chapter 10, this volume).

Because details of first-hand experience are connected in meaningful ways to the target event, the likelihood of gross memory errors or major distortions may be reduced. Brewer (1992) and Neisser and Harsch (1992) attributed some FBM errors to "wrong time slice", in

which a reported memory represents a real occurrence but does not capture the very first time a person heard the news. For example, a person who heard fleetingly from a passer-by that an attack on the World Trade Center had occurred, but later on witnessed the full terror on the television news, might retain the memory of the brief and indefinite first telling for a short time only, and later identify the visually shocking television episode as the "first time". In research studies, wrong time-slice errors weaken the test-retest consistency of FBMs because the transient memory of the unremarkable original event is displaced by a completely different but also accurate memory. These substitution errors are less likely to occur for first-hand experiences because personal circumstances help to define the target event: "A person hit by a car may misremember its color, or the day of the week, but will rarely confuse being hit by a car with, say, falling down a mountain" (Schwarz & Gilligan, 1995, p. 22).

14} Furthermore, people tend to mentally rehearse shocking first-hand experiences for directive or protective functions such as avoiding a future accident.

15} Only momentous and consequential FBMs overlap with first-hand experiences in serving social and self roles. For less salient FBMs these functions are much weaker.

16} Connections between memory type and personal well-being are in general strongest for first-hand experiences. This may increase rehearsal and, hence, persistence of first-hand experiences.

{ 14 Differences between recollections of hearing the news and first-hand experience may result in part from differences in rehearsal that occur in the days, months, and years after initial encoding. Memories of shocking first-hand experiences may be thought about and talked about more frequently and with greater intensity than memories of learning about distant public events. Episodes experienced directly may come to mind readily because they contain information that promotes current well-being. For example, memories of first-hand

experiences can serve a directive function (Pillemer, 1992, 1998, 2003). As described by Brown and Kulik (1977), vivid and long-lasting memories of dangerous and unsettling events would have survival value because they guide present activities away from similar sources of trouble. A contemporary example involves a recent jog on a sunny day, when a large tree limb unexpectedly fell several yards behind me, triggering a detailed memory of the location and ongoing activity. Months later, whenever I near the same spot on the running path, the memory comes to mind and I approach with caution. Examples of memory directives are plentiful in personal life histories (Pillemer, 1998), and the directive function has been shown empirically to be a prominent component of autobiographical memory (Bluck, Alea, Habermas, & Rubin, 2005). Frequent and focused rehearsal, both overt and covert, should enhance the likelihood that a first-hand memory will be highly elaborated and long lasting, although by no means does it guarantee that the memory will be fully accurate.

In contrast to memories of first-hand experiences, news reception memories would not serve a primarily directive or protective function because their content is unrelated to the distant danger or trauma. **{ 15** Instead, memories of news reception events appear to enhance interpersonal connection and personal identity, what have been called the social and self functions of autobiographical memory (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005). Neisser (1982) was the first to emphasize the social motivation to create and preserve elaborate FBMs: "We discuss 'how we heard the news' with our friends and listen eagerly to how *they* heard. We rehearse the occasion often in our minds and our conversations, seeking some meaning in it" (p. 48). According to Neisser's account, the self and social functions are entangled. Memories of hearing the news become an integral part of a person's autobiographical narrative, marking critical intersections between an individual's life and the rest of humanity: "we remember the details of a FB occasion because those details are the links between our own histories and 'History'. We are aware of this link at the time and aware that others are forging similar links" (p. 48).

The social and self functions of FBMs would appear to be especially salient when the public event is truly momentous and consequential, such as the Kennedy assassination or the terrorist attacks of September 11, 2001. For newsworthy but less important events, the motivation to incorporate a "hearing the news" memory into the life narrative and to share the memory with others is minimal. For example, FBMs of the assassination attempt on President Reagan, an event that did not have devastating consequences, were rarely rehearsed overtly: most respondents in Pillemer's (1984) study described a FBM 1 month after the shooting but reported never recounting the memory previously. Five years later, McCloskey et al. (1988) found that about 50% of their respondents had memories of the Reagan shooting. The absence of a motive to remember and to share may contribute to FBM decay.

Memories of hearing the news and first-hand experience may differ with respect to the adaptive functions that they serve, but considerable overlap also exists. Memories of first-hand experience not only inform future behaviours and decisions, they also contribute strongly to personal identity and are shared with others to achieve important interpersonal goals. For example, a child's memory of being kidnapped (Terr, 1990) not only contains information about potential dangers to be avoided, it also contributes to his or her evolving sense of self, and sharing memories of the event with others may elicit empathic responses (Pillemer, 2003). Alternatively, a FBM of hearing about a public tragedy provides some guidance about how to respond personally to such episodes in the future. Many adults who provided memories of learning about the assassination attempt on President Reagan reported first thinking about previous assassinations or attempts (Pillemer, 1984). These memories may have offered some reassurance that shocking public events had happened before and that people were able to cope quickly and move forward. **{ 16** Nevertheless, in most cases connections between specific memory content and personal well-being will be stronger for first-hand events, and this may increase the frequency and purposefulness of rehearsal, and thus the elaborateness and persistence of memories.

This brief comparison of memory types is intended to highlight potential contrasts between hearing the news and first-hand experience. New research, including systematic comparisons of memory functions and rehearsal processes, is necessary to evaluate the speculative conceptual analysis presented here. In the following sections I examine whether existing empirical studies can bring the contrasts into clearer focus.

HOW VALID ARE GLOBAL ASSESSMENTS OF MEMORY ATTRIBUTES?

17} One strategy for comparing FBMs and first-hand experiences involves the use of indices of quality such as consistency.

18} A second strategy examines relationships between memory qualities and predictor variables across episodes.

19} The validity and usefulness of global comparisons between FBMs and first-hand experiences are questionable because the latter make up an extremely broad and diverse analytical category.

20} It is hard to draw firm conclusions from the circumscribed body of research on FBMs of public events. One reason is that newsworthy events vary widely in their influence.

{ 17 Two basic strategies exist for comparing memories of hearing the news and first-hand experience. The first involves comparing these two categories of memory with respect to indices of quality, including consistency, elaboration, and persistence. For example, one could assess whether memories of first-hand experiences tend to be more consistent over time than memories of hearing the news. **{ 18** A second strategy involves identifying relationships between memory qualities and predictor variables (including emotion, surprise, consequentiality, and rehearsal) and then comparing these relationships across episodes of hearing the news and first-hand experience. For example, one could determine if rehearsal is a good predictor of memory consistency for both news reception events and first-hand episodes.

{ 19 The validity and usefulness of global comparisons of memory types based on existing data are questionable because memories of first-hand experience make up an extremely broad and diverse analytical category. Conway (1995) referred to memories of first-hand experiences as "real" FBMs, presumably because they are far more common than memories of hearing the news. "Real" FBMs included "personal" FBMs, such as highly accessible episodes from the first year in college (e.g., Pillemer, Goldsmith, Panter, & White, 1988), and "traumatic" FBMs, such as eyewitness accounts of a crime (e.g., Yuille & Cutshall, 1986). Other researchers have used the term "FBM" to describe topics as diverse as the first menstrual period (Pillemer, Koff, Rhinehart, & Rierdan, 1987) and memories reported by patients in group psychotherapy (Thomsen & Berntsen, 2003). Pillemer (1998) and Rubin and Kozin (1984) identified a wide variety of life events that can give rise to vivid and detailed memories of personal circumstances, including major life turning points, personal injury or accidents, sports triumphs and disappointments, special romantic encounters, and moments of personal insight that have special meaning only for the individual. The task of finding consistent patterns of results within this expansive data set, which can then be compared directly to FBMs of hearing the news, is daunting.

{ 20 Drawing firm overall conclusions about the more circumscribed body of research on FBMs of public events also poses a considerable challenge. Newsworthy events vary widely in their personal, national, and global influence; for example, the assassination attempt on President Reagan in 1981 or the California earthquake of 1989 would appear to be far more limited in scope of impact than the terrorist attacks of September 11, 2001. Outcomes may differ across studies because the target events are not equally newsworthy or life altering. Although some tentative data patterns are discernible across studies, there is no one agreed upon set of conclusions, or an agreed upon methodology for study design, or an agreed upon standard for evaluating study outcomes. (See Wright, Chapter 2, this volume, and Bentsen, Chapter 9, this volume.)

21} Research examining the *consistency* of FBMs of the space shuttle disaster shows challenges, such as time delays, posed by between-study differences.

22} Research examining *predictors* of FBM consistency, such as intensity of emotional reactions, is challenging because predictors are measured in different ways.

23} A systematic quantitative research review, or meta-analysis, can help us gain knowledge on the impact of these differences.

{ 21 Research examining the consistency of FBMs of the space shuttle disaster provides a good illustration of the challenges posed by between-study differences. McCloskey et al. (1988) examined consistency of FBMs at 1 week and 9 months after the event, using a "relatively lax criterion" (p. 174). Responses given at 9 months to four direct questions involving location, activity, source, and reaction were compared to initial responses and coded as same, more specific, more general, inconsistent, or don't remember. Neisser and Harsch (1992) elicited open-ended and cued memories of the space shuttle disaster within 1 day and again about 2.5 years later. Overall consistency was scored on a seven-point scale. Time 2 responses to the categories of location, activity, and informant were given a score of 2 for "essentially correct, a score of 0 for "obviously wrong", and a score of 1 for "intermediate cases" (p. 17). A "bonus point was awarded depending on the quality of descriptions of two minor" attributes: time of day and others present. Bohannon and Symons (1992) examined consistency using yet another questionnaire design, coding scheme, and time delay. The delay was 3 years and only the category of location was used to evaluate consistency. lt is difficult to come up with a precise estimate of FBM consistency for the space shuttle disaster, let alone for the more expansive FBM literature, in part because methods and time delays differ widely across studies.

{ 22 Researchers also measure predictors of FBM consistency, such as intensity of emotional reactions to the event, in different ways. For example, Neisser and Harsch's (1992)

participants answered the open-ended question, "How did you feel about it?" The researchers then converted qualitative responses to scores: respondents who used at least two "strong and negatively toned terms" were assigned a score of 3, those who used one such term were assigned a 2, and those who gave a more neutral or qualified response were assigned a 1. Using this scheme, no effect of emotion on memory was apparent. Bohannon and Symons (1992) directly obtained quantitative emotion ratings on a five-point scale—as the authors predicted, higher affect ratings were strongly associated with more consistent reports. Substantial between study differences exist even among researchers who employ quantitative ratings: some use three-point scales (e.g., Conway et al., 1994), five-point scales (e.g., Bohannon & Symons, 1992; Pillemer, 1984), seven point scales (e.g., Curci & Luminet, 2006; Neisser et al., 1996; Talarico & Rubin, 2003), and eleven-point scales (Christianson, 1989). The scales have a variety of verbal anchors. Using different measurement metrics could contribute to between-study differences in outcomes. (See Curci, Chapter 1, this volume.)

It is hard to determine the precise effect of methodological differences between studies, but it would be a mistake to discount their importance and base comparisons primarily on researchers' summary conclusions (e.g., whether the data are interpreted as supporting a claim of memory consistency or inconsistency). **{ 23** The growing scientific literature on FBMs seems ripe for a systematic quantitative research review or meta-analysis (e.g., Cooper & Hedges, 1994; Light & Pillemer, 1984). In the case of memory consistency, for example, all studies that have assessed this quality would be included in the analysis. Consistency rates would be entered with key study characteristics to determine if consistency scores vary systematically as a function of coding strategy, time delay (e.g., Schmolck, Buffalo, & Squire, 2000), age of participants (e.g., Conway et al., 1994), and other possible sources of outcome differences.

DIRECT COMPARISONS OF HEARING THE NEWS AND FIRST-HAND EXPERIENCE

24} One way to avoid ambiguities in methodology of between-study

differences is to conduct direct comparisons within studies.

25} Rubin and Kozin made direct comparisons by using different *techniques* such as open-ended probes and specific memory cues.

26} Later research employed two different *methods*: Comparing memories from direct or indirect exposure to the same event and comparing memories for a newsworthy and a mundane event that occurred at about the same time.

{ 24 One way to avoid ambiguities associated with between-study differences in methodology is to conduct direct comparisons within studies. In this way, researchers can ensure that methods are consistent across event types. A handful of studies have included memories of both hearing the news and direct experience (Christianson, 1989; Er, 2003; Neisser et al., 1996; Rubin & Kozin, 1984; Talarico & Rubin, 2003; Weaver, 1993).

{ 25 Early in the history of FBM research, Rubin and Kozin (1984) recognized the need for comparative analyses. They elicited college students' three "clearest memories". Participants were given a definition of FBMs to guide their recall. The open-ended probes produced a variety of event types, such as accidents, sports events, encounters with members of the opposite sex, and deaths. Vivid memories overwhelmingly described first-hand experiences; spontaneous descriptions of news reception events were rare (4 of 174 memories). The extremely low incidence of memories of hearing the news could be attributable in part to the immediate historical context of the data collection in 1982; college students would not have been exposed recently to a major public tragedy.

Rubin and Kozin (1984) also provided specific memory cues for 20 events. Probes for first-hand experiences included receiving an admissions letter to college, a car accident, the seventeenth birthday, and the first date. Probes for hearing the news events included the shootings of President Reagan, the Pope, and President Sadat of Egypt, as well as President

Nixon's resignation. Several of the first-hand experiences were identified by most students as producing flashbulb-quality memories: a car accident that they were in or witnessed, the night of the senior prom, meeting your college roommate for the first time, and speaking in front of an audience, among others. The public event that produced the highest incidence of exceptionally vivid memories was the assassination attempt on President Reagan (50%); proportions of other memories of hearing the news that were rated as flashbulb quality were well below 50%. The relatively low percentage of people reporting FBMs of newsworthy events may be attributable in part to the absence of recent public tragedies that were perceived as truly momentous.

{ 26 Following Rubin and Kozin (1984), researchers have employed two principal strategies to compare FBMs of newsworthy events and memories of first-hand experiences: (1) comparing memories representing direct versus indirect exposure to the same momentous event (Er, 2003; Neisser et al., 1996) and (2) comparing memories of hearing about newsworthy events to memories of unrelated mundane personal events that had occurred at about the same time (Christianson, 1989; Talarico & Rubin, 2003; Weaver, 1993).

27} Neisser, comparing direct and indirect exposure to the same event, provides strong evidence that first-hand experiences can be remembered for years.

28} Both Neisser and Er conclude that memories of momentous first-hand experiences which serve a protective and social function lead to rehearsal and, hence, retention.

29} Talarico and Rubin found no difference between a newsworthy event and a mundane event. But their research design caused subjects to focus special attention on the everyday event.

{ 27 Using the first research strategy, Neisser et al. (1996) obtained memories of personal circumstances when learning about the Loma Prieta or "San Francisco" earthquake of 1989, famous for its postponement of the baseball World Series. Direct versus indirect participation was a critical variable. Some college student respondents were Californians who felt the tremors themselves and therefore could provide a memory of first-hand experience. Other students lived in Atlanta and provided a memory of hearing the news. Memories were obtained days after the event and again 1.5 years later. Consistency was scored using a modified version of Neisser and Harsch's (1992) three-point scale (consistent, partly consistent, inconsistent). Comparisons between samples focused on a score composed of three central informational categories: location, activity, and others present.

Between-sample differences in memory consistency were dramatic and revealing. Californian students' responses were almost perfectly consistent over the 1.5 year time interval, with performance "essentially at ceiling" (Neisser et al., 1996, p. 345). In contrast, Atlanta students' memories of hearing the news showed substantial evidence of inconsistencies. In Atlanta, memories of students who had relatives and friends in the affected area were far more consistent than memories of students who *did not*. Other studies also have found high FBM consistency among respondents who had strong interest and personal investment in the target event (e.g., Conway et al., 1994). Neisser et al. (1996) concluded that "recall can be accurate, even if it takes an earthquake to make it so" (p. 356).

{ 28 Neisser et al. (1996) provided strong evidence for the idea that first-hand experiences may be remembered vividly and consistently for months and years. The authors speculated that rehearsal may play a key role in memory preservation. Narratives that portray a "how I didn't die story" illustrate the directive and social functions of recalling first-hand experiences: "Nearness to real danger gives such stories a distinctiveness that few accounts of 'hearing the news' can match" (p. 356). In contrast, the Atlanta students were a continent away from danger, and would not be strongly motivated to think about and share their

personal memories, with the exception of respondents who had Californian friends and relatives.

Er (2003) conducted a study similar in design to the study by Neisser et al. (1996). Turkish participants who directly experienced the 1999 Marmara earthquake were compared to participants who only heard the news. Memory was assessed by a questionnaire administered 6 to 9 months after the earthquake and again 6 months later. Victims of the earthquake were more likely than people who heard the news indirectly to have detailed and vivid memories. Memories reported by on-site victims were more consistent than memories reported by participants who experienced the event indirectly; consistency scores for victims were virtually at ceiling. The authors concluded that FBM inconsistencies observed in prior studies may be attributable to the fact that participants "were not directly affected by the events" (p. 515).

{ 29 Talarico and Rubin (2003) used a different strategy to examine FBM consistency. They compared FBMs of the September 11 terrorist attacks to memories of an ordinary personal event; both memories were obtained 1 day after September 11 and again 1, 6, or 32 weeks later. College students were asked direct questions about September 11, including the categories of informant, time, location, others present, and activity. A second set of questions involved "an everyday event from the participant's life in the days prior to the attacks" (p. 455). Everyday events reported by college students were "typical for the life of an average college student", and included parties, sporting events, and studying (p. 456). As such, they qualify as first-hand experiences. Direct questions included type of event, time of occurrence, location, others present, and activity. Students listed several words that could be used to cue the particular everyday memory in a future testing. They also completed the Autobiographical Memory Questionnaire for both the September 11 memory and the everyday memory; the questionnaire asks participants to provide ratings of a variety of memory features.

Memory consistency was assessed using relatively soft criteria. For example, when describing others who were present, the Time 1 response "friend" and Time 2 response "Sue" were scored as consistent (p. 456). Everyday memories and FBMs showed similar levels of consistency across time periods. FBMs were rated as more emotional and were rehearsed more frequently than were everyday memories, but these qualities did not lead to greater consistency.

Talarico and Rubin's (2003) main finding— that memories of unremarkable everyday events appear to be as consistent as memories of a shocking public disaster—is so striking that it deserves careful scrutiny. One issue concerns the uniqueness of self-selected events. Everyday events singled out by participants appear to represent particular instances of recurrent activities of a typical college student. A memory of studying in the dorm, for example, may have several scripted components (location-dorm room; activity-studying; time-after dinner) that would remain consistent using soft scoring criteria, even if the original event is not remembered vividly.

A second issue involves the classification of the self-nominated events as "everyday". Participants singled out an event to be included in a formal psychological study. Then they answered a series of questions about it and completed the Autobiographical Memory Questionnaire with this particular event in mind. The event may have been ordinary to begin with, but after this focused rehearsal it would appear to have lost its casual, everyday status. In addition, the request for words to "serve as a cue for that unique event in the future" (p. 456), although necessary for follow-up testing, seems to suggest to the participant that the memory could or would be requested again at a later date.

30} Weaver also showed that research subjects can be influenced to

remember everyday events.

31} Christianson showed that without elaborative rehearsal, special cueing, or a request to remember, everyday memories are susceptible to rapid decay.

32} Talarico and Rubin's and Weaver's findings may illustrate the power of event distinctiveness, rehearsal, and motivated remembering

33} While memories of public tragedies are less robust than memories of momentous first-hand events, they are still well remembered. This is probably because memories of public tragedies are distinctive and because we are very likely to rehearse them.

{ 30 An earlier study conducted by Weaver (1993) produced a pattern of findings similar to those reported by Talarico and Rubin (2003). As part of a classroom exercise in cognitive psychology, college students were told that "the next time they saw a roommate (or a friend, if they lived alone), they should do their best to remember all the circumstances surrounding that event" (p. 41). By chance, the 1991 bombing of Iraq began at about the time that the classroom exercise was conducted, and memory questionnaires were completed for both the roommate interaction and hearing the news of the bombing. Follow-up questionnaires were administered 3 months and 11 months later. Memory consistency over time for the two events was similar, with only scattered differences favouring memories of hearing about the public event. The author provided a motivational explanation for the persistence of ordinary memories involving a roommate: "What does appear to be necessary is having the instructions (or intentions) to remember the event" (p. 45).

{ 31 Christianson's (1989) earlier comparison of a FBM and a personal memory suggests that, in the absence of elaborative rehearsal, special cueing, or a request to remember, everyday memories are susceptible to rapid decay. Christianson obtained memories of hearing about the assassination of Swedish Prime Minister Olof Palme 6 weeks after the shooting and again

1 year later, and compared them to respondents' most vivid memory from the Saturday before the first interview. Participants were unaware at Time 1 that they could be contacted again in the future. The personal memory was elicited at Time 2 with a request for a memory of "the event you described from the last Saturday before we called you the first time" (p. 437). The average memory consistency rate for personal circumstances (informant, time of day, location, activity, others present, clothes worn, first thoughts) when learning about the Palme assassination was .80 using soft scoring criteria. Memories of the personal event were scored as consistent if the second memory "included a general description of the same event, regardless of what specific details were mentioned" (p. 439); the consistency rate was only .22. The authors concluded that "the Palme-related circumstances were much better retained than the personal event" (p. 439). Part of the very large difference in consistency rates for memories of the newsworthy event and the personal event could be due to differences in directed rehearsal during the Time 1 interview; participants responded to specific questions and provided ratings only for their memories of the Palme assassination.

{ 32 Rather than demonstrating the ordinariness of FBMs, Talarico and Rubin's (2003) and Weaver's (1993) findings may illustrate the power of event distinctiveness, rehearsal, and motivated remembering. When an everyday event is singled out for special attention and detailed analysis as part of a research study, it is likely to persist for months with a good degree of consistency. **{ 33** Distinctiveness and rehearsal were identified early on by Rubin and Kozin (1984) as likely contributors to memory vividness, and the recent data further underscore their potential importance. In contrast, FBM processes are more automatic; momentous events are distinctive, talked about, thought about, and vividly remembered in the absence of an intervention by a researcher. Although FBMs of hearing about public tragedies may well be less robust than memories of momentous first-hand experiences (Er, 2003; Neisser et al., 1996), it would be premature to equate them with memories of the multitude of mundane and recurring events in our lives.

Appendix E: Structured abstract text

"Hearing the News" versus "Being There"

David B. Pillemer

Background: Flashbulb memories (FBMs) are memories of our personal circumstances when first hearing of a very surprising and consequential event. They are seen as engaging and provocative.

Aim: The text explains the popularity of FBM studies and further aims to call into question the assumption that FBMs and first-hand experiences have similar underlying memory processes.

Method: Narrative literature review.

Results: Dissimilarities between FBMs of public events and traumatic first-hand experiences lie in the greater consequentiality of momentous personal experiences and in the existence of a thematic relationship between the circumstances and the personal experience. Global comparisons between memories have questionable validity because indices of quality (e.g., consistency) and of predictor variables (e.g., rehearsal) vary considerably across studies. In direct comparisons between memory events, different

techniques and methods have been employed. These studies show the role of type of participation and rehearsal of the event on retention.

Conclusion: The distinction between FBMs of newsworthy public events and of momentous first-hand experiences appears to be meaningful on both conceptual and empirical grounds.

Brown and Kulik (1977) first defined flashbulb memories (FBMs) as “memories for the circumstances in which one first learned of a very surprising and consequential (or emotionally arousing) event", and offered the assassination of President John Kennedy as the "prototype case" (p. 73).

Following Brown and Kulik, scores of researchers have examined *FBMs of public events,* including attacks on, deaths of, or resignations of world leaders (e.g., Christianson, 1989; Conway et al., 1994; Curci, Luminet, Finkenauer, & Gisle, 2001; Finkenauer, Luminet, Gisle, EI-Ahmadi, van der Linden, & Philippot, 1998; Pillemer, 1984), World War II events (Berntsen & Thomsen, 2005), the 1986 explosion of the space shuttle *Challenger* (Bohannon, 1988; McCloskey, Wible, & Cohen, 1988; Neisser & Harsch, 1992), the 1989 California earthquake (Neisser, Winograd, Bergman, Schreiber, Palmer, & Weldon, 1996), and the September 11 attacks on the World Trade Center in 2001 (e.g., Curci & Luminet, 2006; Talarico & Rubin, 2003). This list represents only a fraction of the total number of studies on similar topics.

Brown and Kulik (1977) also examined memories of first learning of a "personal, unexpected shock" (p. 79), what could be termed *FBMs of personal events.* Brown and Kulik's instructions to participants guided recall to moments when significant personal news was received, and by far the most common memory theme was learning about the death of a

parent. Studies of remembering one's own life circumstances when receiving important private news are rare. With only a few exceptions (e.g., receiving notification of college admission; Tekcan, 2001), the FBM literature is dominated by large scale surveys of newsworthy public events.

Memories that represent circumstances in which one is an active participant rather than a passive recipient could be termed *memories of first-hand experience.* Because first-hand experiences are so diverse and ubiquitous—including car accidents, trauma, birthday celebrations, the first kiss, and scoring the winning goal—there appears to be little added value in using the targeted term "FBM" to describe them.

Brown and Kulik (1977, p. 99) speculated that properties of FBMs also characterize recall when the target event is a first-hand personal experience: 'Probably the same 'Now Print!' mechanism accounts both for the enduring significant memories in which one has played the role of central character and those in which one has only been a member of an interested audience of millions." Their speculation about similar underlying memory processes deserves more close and careful scrutiny. Brown and Kulik's original study of FBMs has inspired books (Conway, 1995; Winograd & Neisser, 1992) and dozens of journal articles. The goal of this work is not simply to examine memories of hearing about the occasional public tragedy. Rather, the purpose is to enrich our understanding of personal event memory, including highly emotional and tragic events that happen to us directly. For example, studies of FBMs have contributed to the debate about the accuracy of eyewitness testimony (e.g., Ceci & Bruck, 1993). Do FBMs of public events provide a useful and valid model of memories of events that happen to us directly, when we are central players?

In this chapter I first identify reasons why FBMs of public events, which occur so rarely over the course of one's life, generate such intense scientific interest. Second, I outline potential dissimilarities between FBMs and memories of first-hand experience. Third, I question the

validity of global comparisons between these two memory types. Fourth, I describe and evaluate a small set of carefully designed research studies that directly compare memories of news reception events and first-hand experiences.

WHY ARE FBM STUDIES SO POPULAR?

Brown and Kulik's (1977) original presentation of FBM was engaging and provocative. They presented a phenomenon that all readers could readily identify in their own personal experience, yet they emphasized its unusual nature: "It is not the memory of the tragic news that invites inquiry, but the memory of one's own circumstances of first hearing the news. There is no obvious utility in such memories" (p. 74). Brown remembered being on the phone with the dean's secretary at Harvard University when he learned that Kennedy had been shot, but his personal circumstances were unrelated to the public news event. Brown and Kulik noted that "there is something strange about this recall" (p. 74), and described their research endeavor as being "on the trail of a mystery" (p. 98).

Although FBMs may be unusual, they are universally recognized. Academic psychologists know that introducing this topic to students, colleagues, or friends invariably triggers a stream of personal testimonials. The concept is so ubiquitous that Gary Larson parodied it in a cartoon with the caption "More facts of nature: All forest animals, to this very day, remember exactly where they were and what they were doing when they heard that Bambi's mother had been shot." In the cartoon, a possum was 'just getting ready to cross the interstate". In short, Brown and Kulik identified a phenomenon that was at the same time common knowledge, compellingly curious, and lacking any scientific explanation—favourable conditions for inspiring empirical study.

FBMs are an especially attractive research topic for several reasons. Almost everyone is familiar with the concept and is able to produce a memory on demand, so that potential research participants are plentiful. Following an event like the 2001 attack on the World Trade Center, there is a ready pool of people who have received news of the same public trauma at about the same time. The methodology is straightforward— all that is required is a well constructed questionnaire and a willing group of respondents. The set of target events is always expanding— every new public shock or tragedy provides a unique opportunity to test existing hypotheses. In contrast, it is more challenging to conduct large-scale surveys of the “sundry private shocks in each person's life", because of the "absence of a very large population of like-minded people" (Brown & Kulik, 1977, p. 75).

An additional reason why FBM studies are so popular is the intense, almost single-minded scientific interest in the issue of recall accuracy as opposed to other memory functions. Brown and Kulik's provocative title *Flashbulb Memories* and flowery rhetoric suggested the existence of an extraordinarily powerful and unique memory mechanism. They described circumstances under which the "central nervous system will 'take a picture’” (p. 84), and referred to the underlying FBM as "unchanging as the slumbering Rhinegold" (p. 86). If one looks beyond the rhetoric, Brown and Kulik's theoretical model clearly predicts variations in narrative memory elaboration, partly as a result of constructive processes accompanying retellings (Pillemer, 1990). Nevertheless, the strongest possible claims about FBMs— that they are unfailingly accurate, complete, and resistant to forgetting (e.g., McCloskey, Wible, & Cohen, 1988)—generated considerable controversy and strong motivation to conduct empirical tests as new public events presented themselves.

"HEARING THE NEWS" IS NOT THE SAME AS "BEING THERE"

Brown and Kulik (1977) proposed that FBMs of first learning about shocking public events reveal a general cognitive mechanism. The mechanism would have survival value because emotional and important events are frequently experienced directly. For first-hand experiences, the surrounding circumstances define the target event and provide important clues about how to respond to similar episodes in the future. Brown and Kulik speculated that for our distant ancestors the appearance of a new and dangerous carnivore would trigger a vivid memory because the correlated information—the precise location where the intruder was spotted, the ongoing activities that could have provoked an attack, and so on—has protective value. In contrast, present-day FBMs of first hearing about distant public events provide no such survival benefits, because the surrounding circumstances—where you were and what you were doing—are unrelated to the substance of the newsworthy occurrence. FBMs of public events simply reflect the automatic activation of a memory mechanism that evolved earlier, for different purposes.

Although Brown and Kulik speculated that both hearing the news and first-hand experience are recorded by the same underlying memory mechanism, several dissimilarities are apparent. Consequentiality (personal importance or life impact) of these two types of memory certainly differs in fundamental ways. People who experienced from a distance the resignation of Margaret Thatcher (Conway et al., 1994), the explosion of the space shuttle *Challenger* (Neisser & Harsch, 1992), or the attack on the World Trade Center (Talarico & Rubin, 2003) may rate these events as highly important on a seven-point scale presented in a memory questionnaire, but the perceived *personal* life impact must be of a different order than the shock of an unexpected death of a parent or spouse, a serious accident, or a crime victimization. As a citizen of the US it would be difficult to rate the *Challenger* explosion, the death of a president, or a terrorist attack as anything other than consequential, but its day-to-day life impact may pale in comparison to first-hand trauma. Shocking public news and traumatic first-hand experience are likely to be rated differently on Berntsen and

Rubin's (2006) new Centrality of Event Scale, which includes items such as "I feel that this event has become a central part of my life story" and "This event permanently changed my life".

A key difference between first-hand experience and hearing the news is that memories of personal circumstances are related thematically to the target event in the former case only: "Although the fact that an assassination or resignation has occurred may have real consequences for citizens of a given country… the *occasion on which they heard about* it surely does not" (Neisser et al., 1996, p. 353). When thinking or talking about the World Trade Center attacks, memories frequently centre on the newsworthy event itself; personal details come up only when attention is directed specifically to "hearing the news" stories. When thinking or talking about a life-threatening car accident, the personal details are the story (see Curci & Luminet, 2006; Curci, Chapter 1, this volume; and Hirst & Meksin, Chapter 10, this volume).

Because details of first-hand experience are connected in meaningful ways to the target event, the likelihood of gross memory errors or major distortions may be reduced. Brewer (1992) and Neisser and Harsch (1992) attributed some FBM errors to "wrong time slice", in which a reported memory represents a real occurrence but does not capture the very first time a person heard the news. For example, a person who heard fleetingly from a passer-by that an attack on the World Trade Center had occurred, but later on witnessed the full terror on the television news, might retain the memory of the brief and indefinite first telling for a short time only, and later identify the visually shocking television episode as the "first time". In research studies, wrong time-slice errors weaken the test-retest consistency of FBMs because the transient memory of the unremarkable original event is displaced by a completely different but also accurate memory. These substitution errors are less likely to occur for first-hand experiences because personal circumstances help to define the target event: "A person hit by a car may misremember its color, or the day of the week, but will

rarely confuse being hit by a car with, say, falling down a mountain" (Schwarz & Gilligan, 1995, p. 22).

Differences between recollections of hearing the news and first-hand experience may result in part from differences in rehearsal that occur in the days, months, and years after initial encoding. Memories of shocking first-hand experiences may be thought about and talked about more frequently and with greater intensity than memories of learning about distant public events. Episodes experienced directly may come to mind readily because they contain information that promotes current well-being. For example, memories of first-hand experiences can serve a directive function (Pillemer, 1992, 1998, 2003). As described by Brown and Kulik (1977), vivid and long-lasting memories of dangerous and unsettling events would have survival value because they guide present activities away from similar sources of trouble. A contemporary example involves a recent jog on a sunny day, when a large tree limb unexpectedly fell several yards behind me, triggering a detailed memory of the location and ongoing activity. Months later, whenever I near the same spot on the running path, the memory comes to mind and I approach with caution. Examples of memory directives are plentiful in personal life histories (Pillemer, 1998), and the directive function has been shown empirically to be a prominent component of autobiographical memory (Bluck, Alea, Habermas, & Rubin, 2005). Frequent and focused rehearsal, both overt and covert, should enhance the likelihood that a first-hand memory will be highly elaborated and long lasting, although by no means does it guarantee that the memory will be fully accurate.

In contrast to memories of first-hand experiences, news reception memories would not serve a primarily directive or protective function because their content is unrelated to the distant danger or trauma. Instead, memories of news reception events appear to enhance interpersonal connection and personal identity, what have been called the social and self functions of autobiographical memory (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005). Neisser (1982) was the first to emphasize the social motivation to create and preserve elaborate FBMs: "We discuss 'how we heard the news' with our friends and listen eagerly to

how *they* heard. We rehearse the occasion often in our minds and our conversations, seeking some meaning in it" (p. 48). According to Neisser's account, the self and social functions are entangled. Memories of hearing the news become an integral part of a person's autobiographical narrative, marking critical intersections between an individual's life and the rest of humanity: "we remember the details of a FB occasion because those details are the links between our own histories and 'History'. We are aware of this link at the time and aware that others are forging similar links" (p. 48).

The social and self functions of FBMs would appear to be especially salient when the public event is truly momentous and consequential, such as the Kennedy assassination or the terrorist attacks of September 11, 2001. For newsworthy but less important events, the motivation to incorporate a "hearing the news" memory into the life narrative and to share the memory with others is minimal. For example, FBMs of the assassination attempt on President Reagan, an event that did not have devastating consequences, were rarely rehearsed overtly: most respondents in Pillemer's (1984) study described a FBM 1 month after the shooting but reported never recounting the memory previously. Five years later, McCloskey et al. (1988) found that about 50% of their respondents had memories of the Reagan shooting. The absence of a motive to remember and to share may contribute to FBM decay.

Memories of hearing the news and first-hand experience may differ with respect to the adaptive functions that they serve, but considerable overlap also exists. Memories of first-hand experience not only inform future behaviours and decisions, they also contribute strongly to personal identity and are shared with others to achieve important interpersonal goals. For example, a child's memory of being kidnapped (Terr, 1990) not only contains information about potential dangers to be avoided, it also contributes to his or her evolving sense of self, and sharing memories of the event with others may elicit empathic responses (Pillemer, 2003). Alternatively, a FBM of hearing about a public tragedy provides some guidance about how to respond personally to such episodes in the future. Many adults who

provided memories of learning about the assassination attempt on President Reagan reported first thinking about previous assassinations or attempts (Pillemer, 1984). These memories may have offered some reassurance that shocking public events had happened before and that people were able to cope quickly and move forward. Nevertheless, in most cases connections between specific memory content and personal well-being will be stronger for first-hand events, and this may increase the frequency and purposefulness of rehearsal, and thus the elaborateness and persistence of memories.

This brief comparison of memory types is intended to highlight potential contrasts between hearing the news and first-hand experience. New research, including systematic comparisons of memory functions and rehearsal processes, is necessary to evaluate the speculative conceptual analysis presented here. In the following sections I examine whether existing empirical studies can bring the contrasts into clearer focus.

HOW VALID ARE GLOBAL ASSESSMENTS OF MEMORY ATTRIBUTES?

Two basic strategies exist for comparing memories of hearing the news and first-hand experience. The first involves comparing these two categories of memory with respect to indices of quality, including consistency, elaboration, and persistence. For example, one could assess whether memories of first-hand experiences tend to be more consistent over time than memories of hearing the news. A second strategy involves identifying relationships between memory qualities and predictor variables (including emotion, surprise, consequentiality, and rehearsal) and then comparing these relationships across episodes of hearing the news and first-hand experience. For example, one could determine if rehearsal is a good predictor of memory consistency for both news reception events and first-hand episodes.

The validity and usefulness of global comparisons of memory types based on existing data are questionable because memories of first-hand experience make up an extremely broad and diverse analytical category. Conway (1995) referred to memories of first-hand experiences as "real" FBMs, presumably because they are far more common than memories of hearing the news. "Real" FBMs included "personal" FBMs, such as highly accessible episodes from the first year in college (e.g., Pillemer, Goldsmith, Panter, & White, 1988), and "traumatic" FBMs, such as eyewitness accounts of a crime (e.g., Yuille & Cutshall, 1986). Other researchers have used the term "FBM" to describe topics as diverse as the first menstrual period (Pillemer, Koff, Rhinehart, & Rierdan, 1987) and memories reported by patients in group psychotherapy (Thomsen & Berntsen, 2003). Pillemer (1998) and Rubin and Kozin (1984) identified a wide variety of life events that can give rise to vivid and detailed memories of personal circumstances, including major life turning points, personal injury or accidents, sports triumphs and disappointments, special romantic encounters, and moments of personal insight that have special meaning only for the individual. The task of finding consistent patterns of results within this expansive data set, which can then be compared directly to FBMs of hearing the news, is daunting.

Drawing firm overall conclusions about the more circumscribed body of research on FBMs of public events also poses a considerable challenge. Newsworthy events vary widely in their personal, national, and global influence; for example, the assassination attempt on President Reagan in 1981 or the California earthquake of 1989 would appear to be far more limited in scope of impact than the terrorist attacks of September 11, 2001. Outcomes may differ across studies because the target events are not equally newsworthy or life altering. Although some tentative data patterns are discernible across studies, there is no one agreed upon set of conclusions, or an agreed upon methodology for study design, or an agreed upon standard for evaluating study outcomes. (See Wright, Chapter 2, this volume, and Bentsen, Chapter 9, this volume.)

Research examining the consistency of FBMs of the space shuttle disaster provides a good illustration of the challenges posed by between-study differences. McCloskey et al. (1988) examined consistency of FBMs at 1 week and 9 months after the event, using a "relatively lax criterion" (p. 174). Responses given at 9 months to four direct questions involving location, activity, source, and reaction were compared to initial responses and coded as same, more specific, more general, inconsistent, or don't remember. Neisser and Harsch (1992) elicited open-ended and cued memories of the space shuttle disaster within 1 day and again about 2.5 years later. Overall consistency was scored on a seven-point scale. Time 2 responses to the categories of location, activity, and informant were given a score of 2 for "essentially correct, a score of 0 for "obviously wrong", and a score of 1 for "intermediate cases" (p. 17). A "bonus point was awarded depending on the quality of descriptions of two minor" attributes: time of day and others present. Bohannon and Symons (1992) examined consistency using yet another questionnaire design, coding scheme, and time delay. The delay was 3 years and only the category of location was used to evaluate consistency. lt is difficult to come up with a precise estimate of FBM consistency for the space shuttle disaster, let alone for the more expansive FBM literature, in part because methods and time delays differ widely across studies.

Researchers also measure predictors of FBM consistency, such as intensity of emotional reactions to the event, in different ways. For example, Neisser and Harsch's (1992) participants answered the open-ended question, "How did you feel about it?" The researchers then converted qualitative responses to scores: respondents who used at least two "strong and negatively toned terms" were assigned a score of 3, those who used one such term were assigned a 2, and those who gave a more neutral or qualified response were assigned a 1. Using this scheme, no effect of emotion on memory was apparent. Bohannon and Symons (1992) directly obtained quantitative emotion ratings on a five-point scale—as the authors predicted, higher affect ratings were strongly associated with more consistent reports. Substantial between study differences exist even among researchers who employ quantitative ratings: some use three-point scales (e.g., Conway et al., 1994), five-point scales (e.g., Bohannon & Symons, 1992; Pillemer, 1984), seven point scales (e.g., Curci & Luminet,

2006; Neisser et al., 1996; Talarico & Rubin, 2003), and eleven-point scales (Christianson, 1989). The scales have a variety of verbal anchors. Using different measurement metrics could contribute to between-study differences in outcomes. (See Curci, Chapter 1, this volume.)

It is hard to determine the precise effect of methodological differences between studies, but it would be a mistake to discount their importance and base comparisons primarily on researchers' summary conclusions (e.g., whether the data are interpreted as supporting a claim of memory consistency or inconsistency). The growing scientific literature on FBMs seems ripe for a systematic quantitative research review or meta-analysis (e.g., Cooper & Hedges, 1994; Light & Pillemer, 1984). In the case of memory consistency, for example, all studies that have assessed this quality would be included in the analysis. Consistency rates would be entered with key study characteristics to determine if consistency scores vary systematically as a function of coding strategy, time delay (e.g., Schmolck, Buffalo, & Squire, 2000), age of participants (e.g., Conway et al., 1994), and other possible sources of outcome differences.

DIRECT COMPARISONS OF HEARING THE NEWS AND FIRST-HAND EXPERIENCE

One way to avoid ambiguities associated with between-study differences in methodology is to conduct direct comparisons within studies. In this way, researchers can ensure that methods are consistent across event types. A handful of studies have included memories of both hearing the news and direct experience (Christianson, 1989; Er, 2003; Neisser et al., 1996; Rubin & Kozin, 1984; Talarico & Rubin, 2003; Weaver, 1993).

Early in the history of FBM research, Rubin and Kozin (1984) recognized the need for comparative analyses. They elicited college students' three "clearest memories". Participants were given a definition of FBMs to guide their recall. The open-ended probes produced a variety of event types, such as accidents, sports events, encounters with members of the opposite sex, and deaths. Vivid memories overwhelmingly described first-hand experiences; spontaneous descriptions of news reception events were rare (4 of 174 memories). The extremely low incidence of memories of hearing the news could be attributable in part to the immediate historical context of the data collection in 1982; college students would not have been exposed recently to a major public tragedy.

Rubin and Kozin (1984) also provided specific memory cues for 20 events. Probes for first-hand experiences included receiving an admissions letter to college, a car accident, the seventeenth birthday, and the first date. Probes for hearing the news events included the shootings of President Reagan, the Pope, and President Sadat of Egypt, as well as President Nixon's resignation. Several of the first-hand experiences were identified by most students as producing flashbulb-quality memories: a car accident that they were in or witnessed, the night of the senior prom, meeting your college roommate for the first time, and speaking in front of an audience, among others. The public event that produced the highest incidence of exceptionally vivid memories was the assassination attempt on President Reagan (50%); proportions of other memories of hearing the news that were rated as flashbulb quality were well below 50%. The relatively low percentage of people reporting FBMs of newsworthy events may be attributable in part to the absence of recent public tragedies that were perceived as truly momentous.

Following Rubin and Kozin (1984), researchers have employed two principal strategies to compare FBMs of newsworthy events and memories of first-hand experiences: (1) comparing memories representing direct versus indirect exposure to the same momentous event (Er, 2003; Neisser et al., 1996) and (2) comparing memories of hearing about

newsworthy events to memories of unrelated mundane personal events that had occurred at about the same time (Christianson, 1989; Talarico & Rubin, 2003; Weaver, 1993).

Using the first research strategy, Neisser et al. (1996) obtained memories of personal circumstances when learning about the Loma Prieta or "San Francisco" earthquake of 1989, famous for its postponement of the baseball World Series. Direct versus indirect participation was a critical variable. Some college student respondents were Californians who felt the tremors themselves and therefore could provide a memory of first-hand experience. Other students lived in Atlanta and provided a memory of hearing the news. Memories were obtained days after the event and again 1.5 years later. Consistency was scored using a modified version of Neisser and Harsch's (1992) three-point scale (consistent, partly consistent, inconsistent). Comparisons between samples focused on a score composed of three central informational categories: location, activity, and others present.

Between-sample differences in memory consistency were dramatic and revealing. Californian students' responses were almost perfectly consistent over the 1.5 year time interval, with performance "essentially at ceiling" (Neisser et al., 1996, p. 345). In contrast, Atlanta students' memories of hearing the news showed substantial evidence of inconsistencies. In Atlanta, memories of students who had relatives and friends in the affected area were far more consistent than memories of students who *did not*. Other studies also have found high FBM consistency among respondents who had strong interest and personal investment in the target event (e.g., Conway et al., 1994). Neisser et al. (1996) concluded that "recall can be accurate, even if it takes an earthquake to make it so" (p. 356).

Neisser et al. (1996) provided strong evidence for the idea that first-hand experiences may be remembered vividly and consistently for months and years. The authors speculated that rehearsal may play a key role in memory preservation. Narratives that portray a "how I didn't die story" illustrate the directive and social functions of recalling first-hand experiences: "Nearness to real danger gives such stories a distinctiveness that few accounts

of 'hearing the news' can match" (p. 356). In contrast, the Atlanta students were a continent away from danger, and would not be strongly motivated to think about and share their personal memories, with the exception of respondents who had Californian friends and relatives.

Er (2003) conducted a study similar in design to the study by Neisser et al. (1996). Turkish participants who directly experienced the 1999 Marmara earthquake were compared to participants who only heard the news. Memory was assessed by a questionnaire administered 6 to 9 months after the earthquake and again 6 months later. Victims of the earthquake were more likely than people who heard the news indirectly to have detailed and vivid memories. Memories reported by on-site victims were more consistent than memories reported by participants who experienced the event indirectly; consistency scores for victims were virtually at ceiling. The authors concluded that FBM inconsistencies observed in prior studies may be attributable to the fact that participants "were not directly affected by the events" (p. 515).

Talarico and Rubin (2003) used a different strategy to examine FBM consistency. They compared FBMs of the September 11 terrorist attacks to memories of an ordinary personal event; both memories were obtained 1 day after September 11 and again 1, 6, or 32 weeks later. College students were asked direct questions about September 11, including the categories of informant, time, location, others present, and activity. A second set of questions involved "an everyday event from the participant's life in the days prior to the attacks" (p. 455). Everyday events reported by college students were "typical for the life of an average college student", and included parties, sporting events, and studying (p. 456). As such, they qualify as first-hand experiences. Direct questions included type of event, time of occurrence, location, others present, and activity. Students listed several words that could be used to cue the particular everyday memory in a future testing. They also completed the Autobiographical Memory Questionnaire for both the September 11 memory and the

everyday memory; the questionnaire asks participants to provide ratings of a variety of memory features.

Memory consistency was assessed using relatively soft criteria. For example, when describing others who were present, the Time 1 response "friend" and Time 2 response "Sue" were scored as consistent (p. 456). Everyday memories and FBMs showed similar levels of consistency across time periods. FBMs were rated as more emotional and were rehearsed more frequently than were everyday memories, but these qualities did not lead to greater consistency.

Talarico and Rubin's (2003) main finding— that memories of unremarkable everyday events appear to be as consistent as memories of a shocking public disaster—is so striking that it deserves careful scrutiny. One issue concerns the uniqueness of self-selected events. Everyday events singled out by participants appear to represent particular instances of recurrent activities of a typical college student. A memory of studying in the dorm, for example, may have several scripted components (location-dorm room; activity-studying; time-after dinner) that would remain consistent using soft scoring criteria, even if the original event is not remembered vividly.

A second issue involves the classification of the self-nominated events as "everyday". Participants singled out an event to be included in a formal psychological study. Then they answered a series of questions about it and completed the Autobiographical Memory Questionnaire with this particular event in mind. The event may have been ordinary to begin with, but after this focused rehearsal it would appear to have lost its casual, everyday status. In addition, the request for words to "serve as a cue for that unique event in the future" (p. 456), although necessary for follow-up testing, seems to suggest to the participant that the memory could or would be requested again at a later date.

An earlier study conducted by Weaver (1993) produced a pattern of findings similar to those reported by Talarico and Rubin (2003). As part of a classroom exercise in cognitive psychology, college students were told that "the next time they saw a roommate (or a friend, if they lived alone), they should do their best to remember all the circumstances surrounding that event" (p. 41). By chance, the 1991 bombing of Iraq began at about the time that the classroom exercise was conducted, and memory questionnaires were completed for both the roommate interaction and hearing the news of the bombing. Follow-up questionnaires were administered 3 months and 11 months later. Memory consistency over time for the two events was similar, with only scattered differences favouring memories of hearing about the public event. The author provided a motivational explanation for the persistence of ordinary memories involving a roommate: "What does appear to be necessary is having the instructions (or intentions) to remember the event" (p. 45).

Christianson's (1989) earlier comparison of a FBM and a personal memory suggests that, in the absence of elaborative rehearsal, special cueing, or a request to remember, everyday memories are susceptible to rapid decay. Christianson obtained memories of hearing about the assassination of Swedish Prime Minister Olof Palme 6 weeks after the shooting and again 1 year later, and compared them to respondents' most vivid memory from the Saturday before the first interview. Participants were unaware at Time 1 that they could be contacted again in the future. The personal memory was elicited at Time 2 with a request for a memory of "the event you described from the last Saturday before we called you the first time" (p. 437). The average memory consistency rate for personal circumstances (informant, time of day, location, activity, others present, clothes worn, first thoughts) when learning about the Palme assassination was .80 using soft scoring criteria. Memories of the personal event were scored as consistent if the second memory "included a general description of the same event, regardless of what specific details were mentioned" (p. 439); the consistency rate was only .22. The authors concluded that "the Palme-related circumstances were much better

retained than the personal event" (p. 439). Part of the very large difference in consistency rates for memories of the newsworthy event and the personal event could be due to differences in directed rehearsal during the Time 1 interview; participants responded to specific questions and provided ratings only for their memories of the Palme assassination.

Rather than demonstrating the ordinariness of FBMs, Talarico and Rubin's (2003) and Weaver's (1993) findings may illustrate the power of event distinctiveness, rehearsal, and motivated remembering. When an everyday event is singled out for special attention and detailed analysis as part of a research study, it is likely to persist for months with a good degree of consistency. Distinctiveness and rehearsal were identified early on by Rubin and Kozin (1984) as likely contributors to memory vividness, and the recent data further underscore their potential importance. In contrast, FBM processes are more automatic; momentous events are distinctive, talked about, thought about, and vividly remembered in the absence of an intervention by a researcher. Although FBMs of hearing about public tragedies may well be less robust than memories of momentous first-hand experiences (Er, 2003; Neisser et al., 1996), it would be premature to equate them with memories of the multitude of mundane and recurring events in our lives.

Appendix F: Vragenlijst over persoonlijke karakteristieken

Algemene vragenlijst

Vul nu alsjeblieft de volgende vragenlijst in.

1) Wat is je naam? _____

2) Hoe oud ben je? _____ jaar

3) Wat is je geslacht? O man O vrouw

4) Wat is jouw moedertaal O Nederlands

O Anders, namelijk _____

5) In welk studiejaar zit je? _____jaar

6) Heb je ooit iets over “Flashbulb memories” gehoord? O Ja O Nee

7) Hoe goed is je Engels? O Heel goed O Goed O Gemiddeld O Matig O Slecht

8) In welke onderzoeksgroep zat je volgens jou (schatting)? O Controle groep

O Experimentele groep

O Weet ik niet

Appendix G: Vragenlijst over tekstperceptie

Geef aan in hoeverre je het eens bent met onderstaande stellingen. Bij elke vraag is maar één antwoord mogelijk.

	Helemaal mee oneens	**Mee oneens**	**Een beetje oneens**	**Neutraal**	**Een beetje mee eens**	**Mee eens**	**Helemaal mee eens**
1. Ik vond de tekst interessant.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
2. De tekst was begrijpelijk.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
3. De structuur van het document was helder.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
4. De tekst was moeilijk te lezen.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
5. Dit soort teksten moet ik ook voor mijn studie lezen.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
6. Het onderwerp boeide me.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
7. De structuur van het document heeft me geholpen de tekst beter te begrijpen.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
8. Ik vond de tekst leuk om te lezen.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
9. Ik had moeite om alles te begrijpen.	**O**	**O**	**O**	**O**	**O**	**O**	**O**
10. De opbouw van de tekst heeft me afgeleid.	**O**	**O**	**O**	**O**	**O**	**O**	**O**

11. Ik vind het onderwerp belangwekkend.	o	o	o	o	o	o	o
12. De vormgeving van de tekst vond ik prettig.	o	o	o	o	o	o	o
13. Begrip was in deze tekst geen probleem voor mij.	o	o	o	o	o	o	o
14. Ik zou de tekst ook uit mezelf gelezen hebben.	o	o	o	o	o	o	o
15. Ik vond de structuur van de tekst storend.	o	o	o	o	o	o	o
16. Ik heb nu een goed inzicht in het onderwerp van de tekst.	o	o	o	o	o	o	o
17. De tekst was goed gestructureerd.	o	o	o	o	o	o	o
18. Ik heb belangstelling voor het onderwerp van de tekst gekregen.	o	o	o	o	o	o	o

Appendix H: Test items

Vragen over de tekst

Je naam: ……

Je moet nu een aantal vragen over de tekst die je net gelezen hebt beantwoorden. In totaal zijn er 12 vragen. Het aantal punten dat je per vraag kunt halen staat altijd tussen haakjes vermeld. Je mag in je eigen taal schrijven. Je mag ook, als je dat handig vindt, Engelse termen gebruiken. Wil je de vragen kort maar zo goed mogelijk beantwoorden? Succes en bedankt!

1. Geef een korte definitie van de term Flashbulb memory. *(3 punten)*

……
……
……

2. Welke doelen wil de schrijver met de tekst bereiken? *(2 punten)*

……
……
……
……

3. Welke twee soorten FBMs worden er genoemd in de tekst? *(2 punten)*

……
……

4. Wat zijn de twee belangrijkste verschillen tussen opvallende FBMs en opvallende persoonlijke ervaringen (first-hand experiences)? *(2 punten)*

……
……
……
……

5. Hoe wordt het mechanisme dat leidt tot een FBM ook wel genoemd? *(1 punt)*

……
……

6. Waarom is de validiteit problematisch bij globale vergelijkingen tussen FBMs en opvallende persoonlijke ervaringen (first-hand experiences)? *(4 punten)*

……
……
……
……
……
……
……
……

7. Welk voorbeeld wordt genoemd bij studies naar de consistentie van FBMs? *(1 punt)*

……..

8. Naar welke zaken vraagt men meestal als men het heeft over de 'omstandigheden' (circumstances) van een opvallende herinnering? *(2 punten)*

……
……
……
……

9. Rubin en Kozin vroegen studenten hun drie helderste (clearest) herinneringen aan te geven**.** Deze werden opgedeeld in twee soorten herinneringen. Welke van de twee soorten leidde het vaakst tot de helderste herinneringen? *(1 punt)*

……..

10. Welke functies helpen bij het herinneren van een gebeurtenis? *(2 punten)*

……
……
……
…….

11. Noem twee redenen waardoor mensen zich soms onopvallende persoonlijke ervaring net zo goed kunnen herinneren als opvallende FBMs. *(2 punten)*

……
……
……
…….

12. Welke ‘maatregelen’ kunnen in een experimenteel onderzoek verhinderen dat persoonlijke gebeurtenissen snel vergeten worden? *(3 punten)*

……
……
……
……
……
……

Geef de proefleider een teken als je klaar bent. Bedankt voor je deelname!

Appendix I: Duitse versie van de vragenlijst over persoonlijke karakteristieken

Allgemeiner Fragebogen

Füll nun bitte den Fragebogen aus.

9) Wie heißt du? _____

10) Wie alt bist du? _____ Jahre

11) Welchem Geschlecht gehörst du an? O Frau O Mann

12) Was ist deine Muttersprache? O Deutsch O Anders, nämlich_____

13) In welchem Jahr deines Studiums bist du? _____Jahr

14) Hast du schon mal etwas über “Flashbulb memories” gehört? O Ja O Nein

15) Wie gut schätzt du dein Englisch ein? O Sehr gut O Gut O Normal O Mäßig O Schlecht

16) In welche Gruppe warst du deiner Meinung nach eingeteilt (Schätzung)?

O Kontrollgruppe

O Experimentelle Gruppe

O Weiß ich nicht

Appendix J: Duitse versie van de test items

Fragen über den Text

Dein Name: ……

Du musst nun ein paar Fragen über den Text, den du gerade gelesen hast, beantworten. Insgesamt gibt es 12 Fragen. Die Punktzahl die man für eine Frage erreichen kann steht jeweils hinter der Frage in Klammern. Du kannst auf Deutsch schreiben und darfst wenn du möchtest auch Englische Begriffe (aus dem Text) verwenden. Bitte beantworte die Fragen kurz, aber so gut wie möglich. Danke und viel Erfolg!

1. Gib eine kurze Definition von dem Begriff Flashbulb memory. (3 *Punkte*)

……
……
……

2. Welche Ziele will der Autor mit dem Text erreichen? *(2 Punkte)*

……
……
……
……

3. Welche zwei Arten FBMs werden in dem Text genannt? *(2 Punkte)*

……
……

4. Was sind die zwei wichtigsten Unterschiede zwischen auffälligen FBMs und auffälligen persönlichen Erfahrungen (first-hand experiences)? *(2 Punkte)*

……
……
……
…….

5. Wie wird der Mechanismus der zu einem FBM führt auch genannt? *(1 Punkt)*

……
…….

6. Warum ist die Validität bei globalen Vergleichen zwischen FBMs und auffälligen persönlichen Erfahrungen problematisch(first-hand experiences)? *(4 Punkte)*

……
……
……
…….

……
……
……
…….

7. Welches Bespiel wird bei Studien über die Übereinstimmung (consistency) von FBMs genannt? *(1 Punkt)*

……..

8. Wonach fragt man meistens wenn man etwas über die “Umstände” (circumstances) von einer auffallenden Erinnerung wissen will? *(2 Punkte)*

……
……
……
……

9. Rubin en Kozin baten Studenten ihre drei deutlichsten Erinnerungen aufzuschreiben. Diese wurden dann in die zwei Arten Erinnerungen. Welche der zwei Sorten führte am häufigsten zu den deutlichsten Erinnerungen? *(1 Punkt)*

……

10.Welche Funktionen (functions) helfen beim Erinnern an ein Erlebnis? *(2 Punkte)*

……
……
……
……

11. Nenne zwei Gründe durch die Menschen sich manchmal an alltägliche und unauffällige persönliche Erlebnisse genauso gut erinnern können wie an auffällige FBMs. *(2 Punkte)*

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12. Was kann bei Experimenten dazu führen, dass persönliche Erlebnisse nicht so schnell wie normalerweise vergessen werden? *(3 Punkte)*

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Wenn du fertig bist, gib bitte dem Testleiter ein Zeichen. Dankeschön für deine Teilnahme!