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« Quand la mémoire trébuche » : Souvenir des chutes dans le vieillissement normal

Thèse Présentée par

Karim GALLOUJ

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Composition du Jury :

Marion LUYAT, Professeure à l'Université de Lille, présidente
Christine-Vanessa CUERVO-LOMBARD Professeure à l'Université de Toulouse, rapporteure
Valentina LA CORTE, Maîtresse de Conférences à l'Université de Paris Cité, rapporteure
Abdel-Halim BOUDOUKHA, Professeur à l'Université de Nantes, examinateur
Emin ALTINTAS, Professeur à l'Université de Lille, co-directeur
Mohamad EL HAJ, Professeur à l'Université de Nantes, co-directeur

Résumé

Les chutes chez les personnes âgées représentent un problème majeur de santé publique, avec des conséquences à la fois physiques et psychologiques. Si l'impact biomédical des chutes est largement documenté, leur inscription dans la mémoire autobiographique et leur influence sur l'identité personnelle restent peu explorés. Ce travail de thèse s'inscrit dans cette perspective en proposant une approche novatrice de la manière dont les souvenirs de chute sont intégrés ou non dans le récit de vie des personnes âgées. Ce travail propose des travaux empiriques originaux, évaluant la mémorisation : des chutes en mémoire autobiographique chez la personne âgée. A la base de ces travaux, ce travail de thèse introduit un modèle théorique, qui postule que l'intégration des souvenirs de chute dans la mémoire autobiographique est essentielle pour maintenir une identité personnelle cohérente et stable. Selon ce modèle, les souvenirs de chute non intégrés sont associés à des manifestations accrues d'anxiété, de dépression et de peur de la rechute, tandis que les souvenirs bien intégrés favorisent une meilleure résilience et une adaptation psychologique à cet événement traumatique. Cette thèse démontre que la chute ne doit pas être considérée comme un simple accident, mais comme un événement spécifique pouvant profondément influencer le récit de vie et la santé psychologique des personnes âgées. En proposant une approche théorique et clinique intégrative, ce travail ouvre des perspectives prometteuses pour la prise en charge des chuteurs âgés et pour la recherche sur les liens entre mémoire autobiographique et santé psychologique.

Mots-clés : chute ; mémoire ; mémoire autobiographique ; personne âgée ; vieillissement

Abstract :

Falls among older adults represent a major public health issue, with both physical and psychological consequences. While the biomedical impact of falls is well-documented, their integration into autobiographical memory and influence on personal identity remain underexplored areas. This doctoral research aims to address this gap by offering an innovative analysis of how fall-related memories are, or are not, incorporated into the life narratives of older adults. The thesis presents original empirical studies evaluating the effects of falls on autobiographical recall in the elderly. At its core, the research introduces a theoretical model suggesting that the integration of fall-related memories into autobiographical memory is crucial for maintaining a coherent and stable personal identity. According to this model, poorly integrated fall memories are linked to increased manifestations of anxiety, depression, and fear of falling again, whereas well-integrated memories foster greater resilience and psychological adaptation to this traumatic event. The findings demonstrate that a fall should not be viewed merely as an accident but as a specific event with the potential to deeply influence life narratives and the psychological health of older individuals. By proposing an integrative theoretical and clinical approach, this work opens promising avenues for the care of older fallers and for research on the connections between autobiographical memory and psychological health.

Keywords: aging; autobiographical memory; falls; memory; older adult

à mes parents

à Manal, mon épouse

à Wassim, Amin, Maïssa, mes enfants

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INTRODUCTION GENERALE

La chute chez la personne âgée, définie comme l'action de tomber (HAS, 2009), est étroitement reliée au vécu subjectif de la personne. Cette expérience pouvant être traumatisante fait intervenir la mémoire et plus particulièrement la mémoire autobiographique. Notre questionnement porte sur le rôle de la mémoire dans la chute chez la personne âgée, et ceci par l'étude des souvenirs chez les chuteurs âgés.

Ce travail porte sur une réflexion qui trouve son origine dans les nombreuses années de pratiques cliniques et de consultations chute chez la personne âgée. La chute est associée à de nombreuses conséquences dont plusieurs constituent des obstacles à la rééducation (Gillespie, 2009). En effet sur le moment, la chute est une urgence médicale à prendre en charge sur le plan mécanique. Toutefois, la rééducation post-chute peut se trouver entraver par des freins tout d'abord mécaniques mais également non mécaniques. Parmi ces freins, nous pouvons trouver les conséquences psychologiques des chutes, trop souvent, négligées (Bloch, 2015). La littérature décrit essentiellement la peur de chuter et le syndrome post-chute (Bloch, 2015). La peur de tomber renvoie à l'interprétation subjective de la chute entrainant une inquiétude d'intensité variable du sujet à la survenue d'une nouvelle chute qui limite les performances mais également les activités de la vie quotidienne (Mourey, Manckoundia, & Pfitzenmeyer, 2009), alors que le syndrome de post-chute est caractérisé par une inhibition, un repli sur soi voire à une incapacité motrice, assimilés à une phobie de la station debout d'installation aiguë suite à une chute (Manckoundia, Mourey, Tavernier-Vidal, & Pfitzenmeyer, 2007). Un double consensus émerge dans la littérature concernant : 1- l'importance de la composante psychologique dans la chute, 2- et ce, y compris dans les chutes sans fracture (Bloch, 2015). Au final, nous ne pouvons pas résumer la chute à un simple phénomène mécanique mais, prendre en compte la dimension psychologique et subjective, semble essentiel à l'appréhension de la chute.

Ce qui laisse suggérer que l'urgence mécanique n'est pas exclusive et que la prise en charge de son vécu subjectif semble indispensable à une bonne rééducation, à une « véritable guérison ». Ce constat de terrain trouve écho dans la littérature avec un bénéfice de la rééducation exclusivement mécanique limité dans le temps (Gillespie, 2009). Au bout d'un an, le risque de chuter à nouveau est le même, voire plus, sans dégradation de l'état somatique de la personne. Il semblerait de mon expérience de clinicien que la première chute est à la fois « traumatique » (somatique, physique, …) et « traumatisante » (peur de la rechute) et les suivantes sont essentiellement « traumatiques ». L'importance de la première chute semble primordiale dans le parcours de soin. Ne pas tenir compte du vécu subjectif de cette première chute conduirait la rééducation à un échec.

Ce vécu subjectif correspond à la réalité d'un événement en l'occurrence ici la chute mais perçue par la personne elle-même. Il s'agit donc d'une information subjective encodée en mémoire autobiographique. La mémoire autobiographique définie comme la mémoire regroupant l'ensemble des connaissances et événements sur soi, et regroupant le vécu subjectif de l'individu, les connaissances sur soi telles que les chutes. Cette information est intégrée au Soi qui à son tour participe à la planification, l'autorégulation et l'auto-évaluation de l'action. En effet, Fromage (2005) montre, en comparant la représentation de soi de deux groupes de sujets âgés (chuteurs versus non-chuteurs), que le groupe « chuteur » est caractérisé par un discours négatif marqué par une autodépréciation, une perte de confiance et un sentiment d'impuissance. Ces éléments sont en faveur de l'idée que l'évènement de chute est intégré à la représentation de Soi des chuteurs.

Dans ce travail de recherche, nous proposons de faire une lecture des évènements de chute chez le chuteur âgé à la lumière la mémoire autobiographique. Pour ce faire, nous allons présenter brièvement la chute chez la personne âgée, puis passer en revue la littérature sur la chute et la mémoire autobiographique chez cette population. Nous aborderons ensuite deux

études portant sur le souvenir (« rappel ») de la chute et l′intégration de ce souvenir en mémoire, ainsi que leurs conséquences, positives ou négatives, sur l′humeur. Nous conclurons ce document par une présentation de nouvelles perspectives de recherche et une proposition de modélisation du lien entre chute et mémoire autobiographique .

1. LA CHUTE :

1.3. 1.1. Définition, prévalence et déterminants

1.1.1. Définition de la chute

La chute est définie, selon la littérature, comme une perte brutale et involontaire d'équilibre, entraînant la personne au sol ou à un niveau inférieur, sous l'effet de la gravité (HAS, 2009 ; Hauer, Lamb et al., 2006). Il s'agit donc d'un événement survenant indépendamment de la volonté, où le corps, sous l'action de son propre poids, est attiré vers le sol. Ainsi, la chute se caractérise par la survenue imprévue d'un déséquilibre menant à une posture inférieure à celle initialement occupée.

1.1.2. Prévalence

Selon le plan national de prévention des chutes chez les personnes âgées (2022), les chutes sont responsables, chaque année en France, de près de 100 000 hospitalisations et de 10 000 décès. L'étude ChuPADom menée en 2018 par Santé publique France, auprès de personnes âgées de 65 ans et plus hospitalisées après une chute à domicile, révèle un âge moyen des chuteurs de 84,5 ans. 80% des chutes surviennent durant la journée, principalement lors des soins d'hygiène (15 %) ou lors de la marche (14%). Plus de la moitié des personnes concernées avaient déjà chuté au cours des 12 mois précédents.

La fréquence des chutes varie selon les contextes. À domicile, leur incidence moyenne est estimée à 0,65 chute par an chez les personnes âgées de plus de 65 ans, avec des valeurs allant de 0,3 à 1,6 chute selon les études (Rubinstein, 2006). En établissement médico-social (EHPAD, Maison de retraite), l'incidence s'élève en moyenne à 1,7 chute par an après 75 ans (de 0,6 à 3,6 chutes/an). En milieu hospitalier (services de médecine aiguë, soins de suite et réadaptation), les chiffres rapportés par Coussement et De Paepe (2008) oscillent entre 2,2 et 17,1 chutes pour 1 000 patients-jours.

Une étude longitudinale de Pluijm et al. (2006), conduite aux Pays-Bas sur une période de cinq ans, fait état d'une incidence de 25 % pour les chutes répétées. Toutefois, cette prévalence varie selon les critères définissant une chute répétée – généralement caractérisée par la survenue de deux chutes ou plus dans l'année.

En France, trois principales sources de données permettent d'évaluer la fréquence des chutes :

1. L'Enquête permanente sur les accidents de la vie courante (Epac, 2017) : Les personnes âgées de plus de 65 ans représentent 15 % des chutes répertoriées, dont un quart entraînant une fracture. Cette enquête repose sur les données recueillies auprès de huit hôpitaux français et des bases nationales telles que le CépiDc (Inserm). Ces données ne renseignent que sur les chutes uniques.

2. Le baromètre santé de l'INPES

3. la base de données de mortalité issue des certificats de décès enregistrés par le centre d'épidémiologie des causes médicales de décès (CépiDc)

En France, les travaux de Maunourry et collaborateurs (2008) rapportent une prévalence d'environ 10 % pour les chutes répétées, définies comme la survenue d'au moins deux chutes en 12 mois. Cette fréquence augmente avec l'âge, l'institutionnalisation et la polymorbidité. Par exemple, la prévalence des chutes multiples passe de 7 % chez les 64-74 ans à 25 % chez les plus de 84 ans (Lord, Ward et al., 1993). En maison de retraite, 39 % des résidents chutent à plusieurs reprises sur un an. Les recherches de Lord et collaborateurs (1993) en Finlande montrent également que chez les personnes vivant à domicile, 60 % des chutes surviennent à l'extérieur du logement, sans différence significative entre les chuteurs uniques et répétés.

1.1.3. Facteurs de risque

Les facteurs de risque de chute sont classés en deux grandes catégories : les facteurs prédisposants (ou intrinsèques) liés à l'état de santé, et les facteurs précipitants (ou extrinsèques) relevant de causes environnementales ou comportementales. Ces facteurs interagissent et se potentialisent.

1.1.3.1. Facteurs prédisposants (intrinsèques)

D'après les recommandations de la Haute Autorité de Santé (HAS) (2009), les principaux facteurs intrinsèques incluent :

- Un âge supérieur ou égal à 80 ans ;
- Le sexe féminin ;
- Des antécédents de fractures traumatiques ;
- La polymédication (prise de plus de quatre médicaments) ;
- La consommation de psychotropes (benzodiazépines, hypnotiques, antidépresseurs, neuroleptiques) ;
- La prise de médicaments cardiovasculaires (diurétiques, digoxine, antiarythmiques) ;
- Des troubles de la marche ou de l'équilibre (Timed Up and Go $\geq$ 20 secondes, incapacité à tenir en appui unipodal > 5 secondes) ;
- Une diminution de la force musculaire des membres inférieurs et/ou une dénutrition (IMC < 21 kg/m², perte de poids > 5 % en un mois ou > 10 % en six mois) ;
- La présence d'arthrose, de déformations ou de douleurs articulaires ;

- Des anomalies podologiques (orteils déformés, durillons, chaussage inadapté) ;
- Des troubles de la sensibilité des membres inférieurs (test au monofilament, diapason) ;
- Des pathologies neurologiques centrales (maladie de Parkinson, troubles neurocognitifs majeurs, hydrocéphalie à pression normale) ;
- Des affections neurologiques périphériques ou neuromusculaires (canal lombaire étroit, myopathies, ostéomalacie, myasthénie, etc.) ;
- Une baisse de l'acuité visuelle ;
- Un syndrome dépressif (évalué via la Mini-GDS) ;
- Un déclin cognitif (MMSE < 27/30 ou autres tests cognitifs adaptés).

1.1.3.2. Facteurs précipitants (intrinsèques et extrinsèques)

Les facteurs précipitants de chute sont intrinsèques (aigus ou pathologiques), et extrinsèques. Ils peuvent être isolés, ou se cumulés. Les facteurs intrinsèques ont quatre étiologies possibles :

- Cardiovasculaires : l'hypotension orthostatique, un ECG anormal, un malaise ;
- Neurologiques : un AVC, une confusion, des déficits sensitifs ;
- Vestibulaires : des vertiges, une instabilité, un nystagmus, un test de Romberg positif ;
- Métaboliques : une hyponatrémie, une hypoglycémie, des médicaments hypoglycémiants.

Les facteurs précipitants extrinsèques ont quant à eux deux étiologies possibles :

- L'environnement : un éclairage insuffisant, des obstacles, un aménagement inadapté du logement ;
- Les habitudes de vie : l'alcool, la sédentarité, la malnutrition.

La compréhension de ces mécanismes impose une approche préventive globale et personnalisée.

Pour conclure cette section, les chutes chez les personnes âgées résultent d'une interaction complexe entre des facteurs prédisposants intrinsèques, souvent liés à l'état de santé général, et des facteurs précipitants, qu'ils soient intrinsèques, extrinsèques ou comportementaux. Ces multiples influences soulignent la nécessité d'une approche globale pour la prévention des chutes. Cependant, au-delà de leurs causes, les chutes engendrent des conséquences majeures, tant sur le plan physique que sur les dimensions sociales et psychologiques, qui méritent une attention particulière.

2. Conséquences de la chute : physiques, sociales et psychologiques

La chute peut être synonyme de conséquences à la fois physique et psychologique (HAS 2009 , Vellas et al., 1997). La chute est responsable de fractures, de plaies, de contusions. La chute entraîne chez la personne âgée une peur de chuter et une désocialisation.

2.3. 2.1. Conséquences physiques

Bien que la majorité des chutes (60-70%) n'entraînent pas de lésions graves nécessitant une hospitalisation, leurs répercussions physiques restent significatives sur le plan clinique et fonctionnel.

Les chutes sont responsables :

- de traumatismes osseux :

- 6-8% des chutes provoquent des fractures, dont 30% concernent l'extrémité supérieure du fémur (HAS, 2009).

- Les fractures du col fémoral s'accompagnent d'une mortalité à 1 an de 20-30% (Burns & Kakara, 2018).

- Les autres fractures fréquentes touchent le poignet (15%), l'humérus (10%), le pelvis (5%).

- les traumatismes des parties molles :

- Les hématomes (25% des cas), les entorses (15%), les plaies cutanées (10%).

- d'un syndrome de déconditionnement :

- Une perte de 5-10% de masse musculaire en 1 semaine d'alitement (Kortebein et al., 2008).

- Une altération des capacités fonctionnelles (ADL score -30% en 1 mois).

- de complications iatrogènes :

- Les escarres (10-15% des cas hospitalisés), les infections nosocomiales, les thromboses veineuses.

2.4. 2.2. Conséquences sociales

Les chutes génèrent un cercle vicieux de désinsertion sociale aux mécanismes complexes qui associe :

- Une restriction spatiale :

- avec une réduction du périmètre de marche (80% des chuteurs limitent leurs déplacements).

- avec un abandon des activités extérieures dans 60% des cas (Yardley et al., 2005).

- Un isolement relationnel :

- avec une diminution de 40% des interactions sociales à 6 mois (Vellas et al., 1997).

- avec des mécanismes spécifiques : une peur de tomber en public (55%),une honte post-chute (35%).

- Un impact sur l'entourage :

-avec une surcharge des aidants (score Zarit >40 dans 25% des cas).

- avec des conflits familiaux sur le maintien à domicile (30% des situations).

2.5. Conséquences psychomotrices

Le syndrome post-chute (SPC) représente une entité nosologique spécifique en gériatrie, avec :

- une physiopathologie qui associe :

- un dysfonctionnement des boucles sensori-motrices (atteinte des ganglions de la base).

- une hyperactivité noradrénergique (marqueur de stress post-traumatique).

- une sémiologie motrice décrite dans le tableau ci-dessous

Signe	Prévalence	Impact fonctionnel
Rétropulsion	85%	Chutes répétées (OR=3.2)
Marche à petits pas	75%	Perte d'autonomie (ADL -2 pts)
Refus de verticalisation	40%	Risque d'escarres (RR=4.1)

(OR = Odds Ratios, RR= Risques Relatifs, ADL= Activity of Daily Living)

La prise en charge nécessite :

- une rééducation précoce (dans les 72h) avec protocole Vivas (Verticalisation Immédiate par Stimulation Anticipée).

- une approche multimodale (kinésithérapie + TCC + psychomotricité).

2.6. . Conséquences psychologiques

La chute agit comme un trauma psychogène aux répercussions durables avec:

- des troubles anxio-dépressifs :

- un état de stress post-chute (45% des cas à 1 mois).

- une dépression réactionnelle (GDS-15 >5 dans 35% des cas).

- une altération de l'image corporelle :

- un sentiment de "corps traître" (80% des chuteurs répétitifs).

- un syndrome de glissement (15% des cas graves).

Les interventions validées sont :

- les thérapie d'exposition graduée (efficacité prouvée sur la peur de tomber).

- les ateliers de restauration narcissique (art-thérapie, groupes de parole).

L’étude des corrélats neuronaux Du SPC semble être une bonne perspective de recherche : L'étude des corrélats neuronaux du SPC par IRMf pourrait éclairer ses liens avec les réseaux de la mémoire traumatique.

Ce tableau complet montre que les chutes constituent un marqueur de fragilité globale, nécessitant une approche gériatrique intégrée allant au-delà de la simple prévention traumatique. Leur impact cognitif et social mériterait des investigations plus poussées dans le cadre de la psychologie socio-clinique.

En conclusion, les chutes chez les personnes âgées résultent d’une interaction complexe entre des facteurs intrinsèques et extrinsèques, nécessitant une stratégie de prévention multidimensionnelle. Leurs répercussions vont bien au-delà des traumatismes physiques, affectant profondément la sphère psychique, sociale et identitaire. Cette complexité justifie une approche holistique incluant les dimensions biomédicale, environnementale, psychologique et surtout autobiographique de la personne âgée.

En somme, les chutes chez les personnes âgées résultent d'une interaction complexe entre facteurs intrinsèques et extrinsèques, renforçant la nécessité d’une approche préventive multidimensionnelle. Au-delà de leurs causes et de leurs conséquences physiques, sociales et psychologiques, ces événements s’inscrivent également dans la mémoire des individus, influençant potentiellement leur identité personnelle. Cette perspective nous amène à explorer le lien entre mémoire autobiographique et chutes chez la personne âgée

3. Mémoire autobiographique et chutes chez la personne âgée.

L'avancée en âge a une double signification. La première est l'accumulation d'un grand nombre de données et d'événements personnels en mémoire. La seconde est la diminution des capacités cognitives touchant l'acquisition, le stockage et la restitution de souvenirs personnels (Eustache et al., 2023). Le point commun à ces deux constats est la mémoire autobiographique contenant les souvenirs personnels de l'individu à l'origine du sentiment d'identité et de continuité de chacun (Piolino, 2003). Elle est également retrouvée dans la littérature anglo-saxonne sous la dénomination de la mémoire du « SELF » (Conway & Pleydell-Pearce, 2000) renvoyant à un système de mémoire dont l'objet principal est le soi. Elle sert à structurer l'ensemble des informations sur soi au cours du temps et débutant dans l'enfance alimenté par les différents événements de vie (Piolino, 2008).

Deux auteurs princeps modélisent la mémoire autobiographique. Le premier auteur, Tulving (1972), énonce la différenciation entre mémoire épisodique et sémantique. La composante sémantique renvoie à des connaissances acquises par la survenue d'élément de vie dont la dimension temporelle est ignorée par une décontextualisation. Seules les connaissances persistent sous forme d'expertise, de savoir-faire, c'est la mémoire noétique. La composante épisodique renvoie aux souvenirs vécus avec un marquage spatio-temporel qui persiste (Tulving, 1985). Le second auteur, Conway (2005), propose une modélisation tripartite de la mémoire autobiographique avec la période de vie, les évènements généraux, les événements spécifiques. Ces trois sous-composantes sont à l'origine du caractère dynamique de la mémoire autobiographique alimentée par la survenu continue des souvenirs personnels. Les périodes de vie renvoient à des séquences de vie délimitées par des événements de vie clés et se caractérisent par des périodes longues (années ou décennies, ex : la vie estudiantine). Les évènements généraux renvoient à des souvenirs autobiographiques plus spécifiques organisées autour d'un thème ou comportent des événements répétés ou étendus (ex : l'estimation de sa capacité

physique). Les événements spécifiques recouvrent des événements personnels précis caractérisés par une série d'informations phénoménologiques et perceptivo-sensoriels (ex : trauma, chute).

Toute la question de ce travail porte sur le lien entre mémoire autobiographique et la chute chez la personne âgée. Et plus particulièrement, il s'agira de caractériser comment l'évènement de vie, la chute, est intégrée à la mémoire autobiographique et pour quelles conséquences.

4. ARTICLE 1: "I Remember the Fall": Memory of Falls in Older Adults"

La mémoire autobiographique est au centre du rapport de l'individu à son environnement et au temps qui passe. Elle permet de consigner les différents événements de vie survenant dans la vie de l'individu. Comprendre les caractéristiques des souvenirs en mémoire autobiographique offre des perspectives importantes pour la psychologie cognitive sur les mécanismes de stockage des informations et pour la psychologie clinique dans la gestion des conséquences et, en particulier pour la composante émotionnelle de ces souvenirs.

L'article de Gallouj et al. (2023) s'inscrit dans ce cadre de recherche en portant une attention particulière aux événements spécifiques : les souvenirs de chute. L'enjeu principal de l'article intitulé : "I Remember the Fall: Memory of Falls in Older Adults" est d'explorer comment les personnes âgées chuteuses se souviennent de leurs chutes comparées à d'autres souvenirs. L'article vise à combler un manque dans la littérature scientifique en explorant les souvenirs de « chute » versus « contrôle » (autres souvenirs) sur les six caractéristiques suivantes : spécificités des souvenirs, valence émotionnelle, tendance à « voyager dans le temps » (auto-noétique ?), imagerie visuelle, importance et répétition des souvenirs. Il s'agira

donc d’abonder dans le sens du modèle de Conway (2005) sur la mémoire autobiographique qui suggère que les événements spécifiques sont organisés en fonction de leur importance pour la continuité et la cohérence de l’identité de l’individu. Les souvenirs de chutes mettant en danger cette intégrité de l’identité, jugés importants pour l’identité personnelle, seraient maintenus et rappelés plus fréquemment, avec une charge émotionnelle forte.

Résumé :

Objectifs : Bien qu'il existe une vaste littérature sur les chutes et leurs conséquences chez les personnes âgées, on sait peu de choses sur la manière dont elles se souviennent de ces événements. Nous avons abordé cette lacune en invitant des personnes âgées à se remémorer des chutes et des souvenirs de contrôle.

Méthodes : Nous avons analysé la spécificité des souvenirs et invité les participants à évaluer la valence émotionnelle, le voyage mental dans le temps, les images visuelles, l'importance et la répétition, tels qu'expérimentés lors de la récupération des souvenirs.
Résultats : Bien que l'analyse n'ait révélé aucune différence significative entre les souvenirs de chutes et les souvenirs de contrôle en termes de spécificité, les participants ont évalué les souvenirs de chutes comme étant plus négatifs que les souvenirs de contrôle. De plus, ils ont noté que les souvenirs de chutes déclenchaient un voyage mental dans le temps, des images visuelles, une importance et une répétition plus élevés que les souvenirs de contrôle.
Conclusions : La valence émotionnelle négative des souvenirs de chutes, ainsi que leur capacité à déclencher des niveaux significatifs de voyage mental dans le temps, d'images visuelles, d'importance et de répétition, démontrent en quoi ces souvenirs diffèrent des autres souvenirs chez les personnes âgées.

Implications cliniques : Ces résultats montrent comment les chutes peuvent moduler les souvenirs d'événements personnels chez les personnes âgées.

Mots-clés : vieillissement ; mémoire autobiographique ; chutes ; mémoire ; souvenir de chutes

“I Remember the Fall”: Memory of Falls in Older Adults”

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Running head: Memory of falls

“I remember the fall”: memory of falls in older adults

Karim GALLOUJ MD [1]

Emin ALTINTAS PhD [1, 2]

Mohamad EL HAJ PhD [1, 3, 4]

[1] Unité de Gériatrie, Centre Hospitalier de Tourcoing, Tourcoing, France

[2] Laboratoire PSITEC – Psychologie: Interactions Temps Émotions Cognition, Université Lille Nord de France – 59000 Lille – France

[3] Nantes Université, Univ Angers, Laboratoire de Psychologie des Pays de la Loire (LPPL - EA 4638), F-44000 Nantes, France

[4] Institut Universitaire de France, Paris, France

Correspondence should be addressed to: Mohamad EL HAJ, Faculté de Psychologie, LPPL – Laboratoire de Psychologie des Pays de la Loire, Université de Nantes, Chemin de la Censive du Tertre, BP 81227, 44312 Nantes Cedex 3, France. E-Mail: mohamad.elhaj@univ-nantes.fr

Objectives: While there is a large body of research on falls and their consequences in older adults, little is known about how older adults remember them. We addressed this gap by inviting older adults to remember falls and control memories.

Methods: We analyzed specificity of memories and invited participants to rate emotional valence, mental time travel, visual imagery, importance and rehearsal, as experienced during retrieval.

Results: Although analysis demonstrated no significant differences between memories of falls and control memories regarding specificity, participants rated memories of falls as more negative than control memories. Furthermore, they rated memories of falls as triggering higher mental time travel, higher visual imagery, higher importance, and higher rehearsal than control memories.

Conclusions: The negative emotional valence of memories of falls, as well as their ability to trigger significant levels of mental time travel, visual imagery, importance and rehearsal, demonstrate how these memories are different from other memories in older adults.

Clinical implications: The findings demonstrate how falls can modulate memory of personal events in older adults.

Keywords: aging; autobiographical memory; falls; memory; memory of falls

A common, serious and growing public health problem for older adults is falls. Almost one-third of people aged 65 and older fall every year (Bergen, 2016; Morrison, Fan, Sen, & Weisenfluh, 2013) and these falls often result in serious injuries, decreased mobility, reduced quality of life and premature institutionalization (Ambrose, Paul, & Hausdorff, 2013; Tinetti & Williams, 1998). Epidemiological research has identified several fall-related risk factors in older adults such as motor and sensory limitations, medication use (i.e., fall risk–increasing drugs) and cognitive impairment (de Zwart et al., 2015; Deandrea et al., 2010). Other factors

that increase the risk of falls are fear of falls, depression, and anxiety (Hallford, Nicholson, Sanders, & McCabe, 2016; Painter et al., 2012; Singh, Bélanger, & Thomas, 2018; Turcu et al., 2004). A meta-analysis examining the relationship between falls and anxiety in older adults has reported that high anxiety is associated with a 1.53 times increased risk of falling (Hallford et al., 2016). Given the aging of the "boomer" generation and the growth of the older population in general, people are living longer with conditions such as cardiovascular diseases, diabetes and arthritis. These medical conditions are known to increase fall risk, which will make falls in older people a major public health concern.

Given their medical and economic burden, it is important to study the psychological consequences of falls in older adults. It would be of interest to investigate whether older adults retain negative memories of episodes of falls or, conversely, whether they manage to regulate them. This issue is important because negative/unresolved memories are typically associated with psychological distress (e.g., depression, trauma) (Williams & Scott, 1988). To tackle this issue, we investigated the characteristics of memory of falls in older adults. We evaluated the specificity (i.e., whether these memories are specific) and emotional valence of these memories (i.e., whether they are considered as positive or negative). We also investigated reliving (i.e., whether retrieval triggers strong mental time travel), visual imagery (i.e., whether retrieval triggers mental images), rehearsal (i.e., whether older adults frequently think or talk about these memories) and importance of memories of falls. In our view, this study may reveal a negative, or even traumatic, memory of falls in older adults.

We assessed the specificity of memories because normal aging has been associated with difficulties to retrieve specific memories (i.e., memories of unique events located in specific time and space). For instance, Peters, Fan, and Sheldon (2019) found that, compared with younger adults, older adults produced fewer specific autobiographical (i.e., personal) events when remembering. These findings reflect research demonstrating that autobiographical recall

is more schematic in older adults than in younger ones (El Haj et al., 2019; El Haj & Gallouj, 2019; Levine, Svoboda, Hay, Winocur, & Moscovitch, 2002; Piolino et al., 2010). Regarding emotion, autobiographical memories of older adults without clinical conditions are generally positive (El Haj et al., 2020; El Haj & Gallouj, 2019). This positive shift mirrors the Socio-emotional Selectivity Theory (Carstensen, Isaacowitz, & Charles, 1999; Carstensen et al., 2011), according to which older adults benefit from high levels of emotional stability and successful emotional regulation. This stability results in a preference for positive information, a mechanism that has been referred to as an age-related "positivity effect". Regarding reliving and visual imagery, these subjective components were evaluated in normal aging by Piolino et al. (2006), who invited older adults to decide whether retrieved memories triggered a sense of recollection (i.e., "Remember responses") or a feeling of familiarity (i.e., "Know responses"). They were also asked to decide whether they retrieved the memories from a field perspective (i.e., memories viewed through our own eyes) or from an observer perspective (i.e., memories viewed from a spectator's standpoint). Results demonstrated decreased "Remember/Field responses" in older adults, suggesting decreased subjective experience and visual imagery during autobiographical retrieval in normal aging.

Unlike specificity, emotion, and the subjective experience of autobiographical memory, little is known about how older adults rehearse their memories. We therefore investigated rehearsal to understand whether older adults think repeatedly about their falls. Regarding importance, we evaluated this variable to understand whether older adults consider falls as important or as insignificant events. This issue is important to understand whether older adults consider falls as central to their life story and identity.

To summarize, we investigated whether memories of falls in older adults are specific and emotional, and whether they trigger mental time travel, visual imagery, importance and rehearsal. By doing this, we aimed to understand whether memories of falls are regulated

successfully or whether they trigger negative content or even abnormally high subjective experience, as observed in memories of traumas. To this end, we invited older adults who had experienced falls in the previous six months to remember them as well as to remember a control event. We expected that, compared with control memories, memories of falls would be more specific, negative, and would trigger higher mental time travel, visual imagery, importance, and rehearsal.

Method

Participants

The study included 47 older adults (26 women and 21 men; *Mean* age = 65.32 years, *SD* = 4.71). No significant differences were observed regarding sex distribution [X^2 (1, N = 47) = .53, p = .46]. Participants were recruited from medical centers in France but were independent and living at home. Prior to inclusion, all participants gave their written informed consent in accordance with the principles laid down by the Helsinki Declaration. They were all native French speakers with normal or corrected-to normal vision and hearing. Inclusion criteria were falls which were defined as an unexpected event in the last six months in which the participant came to rest on the ground, floor, or lower level (Buchner et al., 1993). The six-month interval served to control for the age of the memory (e.g., older adults remember adulthood memories differently from recent ones) (El Haj & Gallouj, 2019; Jansari & Parkin, 1996; Janssen, Rubin, & St Jacques, 2011). Exclusion criteria were a history of neurological, psychiatric or learning disorders.

Participants were screened for cognitive impairment with the Mini Mental State Examination (Folstein, Folstein, & McHugh, 1975). Their mean score was 28.57 points (*SD* = 1.08) out of 30. Because the study concerned memory performances, we tested the episodic memory of participants with the Grober and Buschke (1987). On this task, participants had to

retain 16 words. After immediate cued recall, they proceeded to a 20-second distraction phase during which they had to count numbers aloud. The distraction phase was followed by two minutes of free recall and the recall score (out of a maximum of 16) was retained as the episodic score. The mean score of participants was 10.55 points (*SD* = 2.87). To control for depression, we used the depression subscale of Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983), which consists of seven items scored on a four-point scale ranging from 0 (not present) to 3 (considerable). The cut-off for definite depression was set at > 10/21 points (Herrmann, 1997) and the mean score of participants was 6.28 points (*SD* = 2.21). Note that the original sample included 64 participants. However, six participants were excluded as they declared a history of psychiatric/neurological disorders, four were excluded as they performed below the norms on the Mini Mental State Examination (below 26 or 27 points, depending on their educational level), three were excluded as they performed below the norms on the Grober and Buschke task, and four were excluded as they performed above the cut-off of the Hospital Anxiety and Depression Scale. The final sample size had an approximate 98% power. This power was calculated a priori using G*Power and calculation was conducted with Wilcoxon tests based on an estimated probability of making a type I error as .05, and a medium effect size of 0.5.

Procedures

Participants were invited to provide a memory of a fall as well as a control memory. They were instructed verbally to recount the fall and to be precise and specific (i.e., to describe where and when the fall took place, who was there, what they did, as well as their feeling during the event). When participants had had several falls, which was the case for five participants, they were invited to retrieve the recent one. They were given two minutes to describe the event, as this duration has been found to be sufficient for autobiographical retrieval in older adults (El

Haj et al., 2019; El Haj et al., 2020). The same instructions were provided for the control memory, but participants were invited to remember any event from the previous six months. If they could not remember anything, which was the case of four participants, they were given the cue "an event with family" which prompted their memories. The "fall" and "control" memories were counterbalanced across participants.

To evaluate specificity, we analyzed memories with the scale from the Test Episodique de Mémoire du Passé (Piolino et al., 2006), an autobiographical instrument based on autobiographical models (Conway, 2005) and classic autobiographical evaluations (Kopelman, Wilson, & Baddeley, 1989) and adapted for French populations. For each memory, we attributed zero if there was no memory or only general information about a theme, one point for a repeated or an extended event, two points for an event situated in time and/or space, three points for a specific event lasting less than 24 h and situated in time and space, and four points for a specific event situated in time and space and enriched with phenomenological details (e.g., feeling, emotions, thoughts). Consider the following example: "last month in the afternoon, I went to my basement to check that the heater was in working order, I was walking fast and the stair was wet so once I put my foot on the first step, I fell on the next three steps. I fell straight over like a tree on my back. It didn't hurt me but it made me feel pretty stupid and pretty old, especially since I couldn't get up before a couple of minutes in which I seriously considered that I could lose my independence and finish in a wheelchair or something like that. I even avoided the basement for a couple of days after the fall." This memory was attributed four points as a specific event situated in time and space and enriched with phenomenological details. Specificity was coded by two independent raters (trained psychologist who were not affiliated with the project) who were blind to the hypotheses, high inter-rater agreement coefficients were obtained (Cohen's Kappa coefficient $\kappa = .90$) (Brennan & Prediger, 1981).

Regarding the remaining variables (i.e., emotion, mental time travel, visual imagery, importance and rehearsal), they were directly rated by the participants after the retrieval of the "fall" and "control" memories. Emotion was rated on the item "when I remember the event, I feel an emotion": one = very negative, two = negative, three = neutral, four = positive and five = very positive. Mental time travel was rated on the item "when I remember the event, I feel that I am traveling back to the time it happened": one = not at all, two = slightly, three = moderately, four = quite a bit, and five = extremely. Visual imagery was rated on the item "when I remember the event, I can see it in my mind": one = not at all, two = slightly, three = moderately, four = quite a bit, and five = extremely. Importance was rated on the item "this event is significant for my life": one = not at all, two = slightly, three = moderately, four = quite a bit, and five = extremely. Rehearsal was rated on the item "since this event happened, I have thought or talked about it": one = not at all, two = slightly, three = moderately, four = quite a bit, and five = extremely. These items were largely inspired by the Autobiographical Memory Questionnaire (Rubin, Schrauf, & Greenberg, 2003) and by research on the phenomenological characteristics of autobiographical memory in older adults (El Haj, Kapogiannis, & Antoine, 2016; El Haj & Nandrino, 2017).

Statistical analysis

Statistical analysis was performed with SPSS. We compared scores of specificity, emotion, mental time travel, visual imagery, importance and rehearsal between memories of falls and control memories, as displayed in Table 1. We compared memories of falls and control memories with Wilcoxon tests. We also compared the rating of each scale, as provided by participants, with the rating scale values using Wilcoxon tests to determine how to interpret the rating. We provided effect sizes using Cohen's *d* criterion (Cohen, 1992) (0.20 = small, 0.50 = medium, 0.80 = large). Effect size was calculated for non-parametric tests according to the recommendations of Rosenthal and DiMatteo (2001), and Ellis (2010). For all tests, the level

of significance was set at $p \leq 0.05$, and p values between 0.051 and 0.10 were considered as trends, if any.

Results

No significant differences in specificity

Analysis demonstrated no significant differences in specificity of memories of falls and control memories ($Z = 1.12$, $p = .26$, Cohen's $d = .33$).

Memories of falls are negative

Significant differences were observed between emotional valence of memories of falls and emotional valence of control memories ($Z = 4.43$, $p < .001$, Cohen's $d = 1.69$). To probe the value of emotional rating, we compared the rating of memories of falls (i.e., -.74) with the value of minus one point (i.e., the "negative" value on the emotional scale). Analysis demonstrated no significant differences ($Z = 1.21$, $p = .22$, Cohen's $d = .36$). In other words, memories of falls were rated as negative. Needless to say that significant differences were observed between the rating of memories of falls and the remaining values of the scale (i.e., the values: very positive, positive, neutral, and very negative). We also compared the rating of control memories (i.e., .87) with the value of one point (i.e., the "positive" value on the emotional scale). Analysis demonstrated no significant differences ($Z = .61$, $p = .54$, Cohen's $d = .18$). In other words, control memories were rated as positive.

Higher mental time travel for memories of falls than for control memories

Analysis demonstrated higher mental time travel for memories of falls than of control memories ($Z = 3.37$, $p = .001$, Cohen's $d = 1.13$). To probe the value of mental time travel, we compared the rating of memories of falls (i.e., 3.94) with the value of four points (i.e., "quite a bit" on the mental time travel scale). Analysis demonstrated no significant differences ($Z = .23$, $p = .81$, Cohen's $d = .07$). In other words, memories of falls were rated as triggering mental time travel 'quite a bit'. Needless to say that significant differences were observed between the

rating of memories of falls and the remaining values of the scale. We also compared the rating of control memories (i.e., 3.17) with the value of three points (i.e., "moderately" on the mental time travel scale). Analysis demonstrated no significant differences ($Z = 1.00$, $p = .32$, Cohen's $d = .29$). In other words, control memories were rated as moderately triggering mental time travel.

Higher visual imagery for memories of falls than for control memories

Analysis demonstrated higher visual imagery for memories of falls than for control memories ($Z = 3.11$, $p = .002$, Cohen's $d = 1.02$). To probe the value of visual imagery, we compared the rating of memories of falls (i.e., 3.87) with the value of four points (i.e., "quite a bit" on the visual imagery scale). Analysis demonstrated no significant differences ($Z = 1.01$, $p = .31$, Cohen's $d = .29$). In other words, memories of falls were rated as triggering visual imagery 'quite a bit'. Significant differences were observed between the rating of memories of falls and the remaining values of the scale. We also compared the rating of control memories (i.e., 3.15) with the value of three points (i.e., "moderately" on the visual imagery scale). Analysis demonstrated no significant differences ($Z = .94$, $p = .35$, Cohen's $d = .28$). In other words, control memories were rated as moderately triggering visual imagery.

More importance for memories of falls than for control memories

Analysis demonstrated greater importance of memories of falls than of control memories ($Z = 3.44$, $p = .001$, Cohen's $d = 1.16$). To probe the value of importance, we compared the rating of memories of falls (i.e., 2.87) with the value of three points (i.e., "moderately" on the importance scale). Analysis demonstrated no significant differences ($Z = .84$, $p = .40$, Cohen's $d = .25$). In other words, memories of falls were rated as moderately important. Significant differences were observed between the rating of memories of falls and the remaining values of the scale. We also compared the rating of control memories (i.e., 2.04) with the value of two points (i.e., "slightly" on the importance scale). Analysis demonstrated

no significant differences (Z = .22, p = .83, Cohen's d = .06). In other words, control memories were rated as slightly important.

More rehearsal for memories of falls than for control memories

Analysis demonstrated greater importance for memories of falls than for control memories (Z = 3.18, p = .001, Cohen's d = 1.05). To probe the value of rehearsal, we compared the rating of memories of falls (i.e., 3.02) with the value of three points (i.e., "moderately" on the rehearsal scale). Analysis demonstrated no significant differences (Z = .01, p = .99, Cohen's d = .01). In other words, memories of falls were rated as moderately rehearsed. Significant differences were observed between the rating of memories of falls and the remaining values of the scale. We also compared the rating of control memories (i.e., 2.13) with the value of two points (i.e., "slightly" on the rehearsal scale). Analysis demonstrated no significant differences (Z = .86, p = .39, Cohen's d = .25). In other words, control memories were rated as slightly rehearsed.

[INSERT TABLE 1 APPROXIMATELY HERE]

Discussion

We assessed how older adults remember their falls. While analysis demonstrated no significant differences between memories of falls and control memories regarding specificity, participants rated memories of falls as more negative compared with control memories. In addition, participants rated memories of falls as triggering more mental time travel, more visual imagery, more importance, and more rehearsal than control memories.

The main finding was the lack of significant differences between memories of falls and control memories regarding specificity. In other words, both memories of falls and control memories referred to unique events occurring in a specific time and space. However, while memories of falls and control memories triggered the same levels of specificity, the former

were rated as negative and the latter as positive. The positive valence of control memories mirrors the age-related positivity effect as proposed by the Socio-emotional Selectivity Theory (Carstensen et al., 1999; Carstensen et al., 2011). On the other hand, the negative value of memories of falls can be attributed to the physical difficulties and pain that falls may induce and/or to the consequences of falls such as injuries and decreased mobility. This negative valence may also be associated with the fear of falling. The memory of falls may trigger the anticipation of other falls (i.e., fear of falling), leading to negative emotion during remembering.

Besides triggering negative emotional content, memories of falls triggered a high level of mental time travel. In other words, they triggered a consciousness experience in which participants were able to cast their minds back in time to re-experience the falls. This subjective experience was characterized by significant visual imagery as participants reported higher visual imagery for memories of falls than for control memories. These findings are of interest because decreased mental time travel and visual imagery during autobiographical retrieval have been reported in older adults (Piolino et al., 2006). Thus, although older adults demonstrate diminished mental time travel and visual imagery during remembering, memories of falls can trigger significant levels of subjective experience despite their advanced age. Not surprisingly, these memories can trigger significant levels of importance and rehearsal, as reported by our participants. The importance of memories of falls may explain the high levels of mental time travel and visual imagery of these memories, as older adults might consider falling as a turning point in their lives, i.e. as a clear sign of physical fragility and imminent dependence on others. Due to their significance/consequences, memories of falls may be significantly rehearsed (e.g., repeated in mind, recounted), which may reinforce the subjective experience during remembering.

The negative emotional valence of memories of falls, as well as their ability to trigger significant levels of mental time travel, visual imagery, importance and rehearsal, can be seen

in the light of traumatic memories. Traumatic memories are typically negative and trigger high levels of mental time travel and vividness (Conway, 2005; Rubin, 2005; Shin et al., 1997). Visual imagery can even be associated with flashbacks, as observed in posttraumatic stress disorder (Bryant & Harvey, 1996). Traumatic memories also play a key role in the life story and can form a central component of personal identity (Berntsen & Rubin, 2007). Thus, memories of falls share several characteristics with traumatic memories. Importantly, we do not claim that memories of falls are traumatic, especially since our study did not include an assessment of trauma. However, memories of falls might be better understood if studied in the context of traumatic memories or simply as anxious memories. Regardless of this debate, the characteristics of memories of falls, as revealed in our study, demonstrate how they are different from ordinary memories.

Research has demonstrated how decline in episodic memory can be a risk factor for falls in older adults (Martin et al., 2009), a relationship was found to be mediated by the effects of activity, mobility, and grip strength (van Schoor, Smit, Pluijm, Jonker, & Lips, 2002). It has also demonstrated how subjective memory complaints in older adults, which can predict the development of cognitive impairment and dementia in general, can also predict falls (Al-Sari, Tobias, Archer, & Clark, 2017). Together, research has demonstrated how memory decline can predict falls in older adults. Our study contributes to this research by demonstrating how falls modulate and influence memory in older adults.

A potential limitation of this study is the assessment of memories of only recent falls. While the six-month interval was designed to control for the age of memories, it would be of interest to evaluate memories of falls that occurred longer in the past. This might reveal whether such memories are emotionally regulated and/or successfully integrated into the life story of older adults. In other words, while the valence of memories of recent falls is negative, it might

become positive over time. Such emotional regulation would be possible within the framework of the Socio-emotional Selectivity Theory (Carstensen et al., 1999; Carstensen et al., 2011).

Several clinical implications can be derived from our study. Due to their negative valence and high subjective experience, memories of falls should be targeted in clinical interventions as they may play a role in generating fear of falling and loss of confidence in oneself. By understanding how older adults remember falls, clinical interventions can be developed to address rehabilitation of memories of falls, as well as the cognitive characteristics of these memories, this to alleviate fear of falls. Because falls are associated with anxiety and depression (Hallford et al., 2016; Painter et al., 2012; Singh et al., 2018; Turcu et al., 2004), clinical interventions should target not only the cognitive characteristics of these memories (e.g., their specificity), but also anxiety and depression as associated with these memories.

By assessing the effects of falls on autobiographical memory, this study offers a first glimpse into the characteristics of memories of falls in older adults. These memories seem to be special and merit further investigation.

Clinical implications

- Memories of falls should be targeted in clinical interventions as they may play a role in generating fear of falling
- These memories can also play a role in generating loss of confidence in oneself

Disclosure statement

The authors declare no conflict of interest.

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Table1

Medians of specificity, emotion, mental time travel, visual imagery, importance and rehearsal for "falls" and "control" memories

	Falls memories	Control memories
Specificity	4.00 (.65) $^{n/s}$	4.00 (.74)
Emotion	-1.00 (1.31) ***	2.00 (1.41)
Mental time travel	4.00 (1.03) ***	3.00 (1.07)
Visual imagery	4.00 (.87) ***	3.00 (1.08)
Importance	3.00 (.99) ***	2.00 (.99)
Rehearsal	3.00 (1.34) ***	2.00 (.97)

Note. Scores of specificity ranged from zero "no memory or general information" to four points "specific memory"; scores of emotion ranged from one "very negative" to five points "very positive"; scores of mental time travel, visual imagery, importance, and rehearsal ranged from one "not at all" to five points "extremely"; Standard deviations are given in brackets; differences were $^{n/s}$not significant or significant at $^{**}p < .01$, $^{***}p < .001$

Nos résultats montrent bien une différence significative entre les souvenirs de « chute » versus « contrôle » sur les dimensions valence émotionnelle, tendance à « voyager dans le temps », imagerie visuelle, importance et répétition des souvenirs. Aucune différence n'est retrouvée pour la dimension « spécificités des souvenirs ». Ces résultats contribuent à caractériser comment le chuteur âgé vit sa chute. Celle-ci est vécue comme une expérience subjective plus intense et surtout négative.

La contribution originale de cette publication est d'alimenter le modèle de Conway (2005), en particulier sur l'étude des souvenirs autobiographiques d'événements spécifiques tels que les chutes chez la personne âgée. Ces souvenirs alimenteraient la construction de l'identité de la personne âgée. Ces souvenirs semblent constituer des points de références critiques dans la vie de la personne âgée, et dans le cas spécifique de la chute, ils constitueraient ainsi des points de rappel de la fragilité de ces derniers. Cette intégration des souvenirs de chutes dans la structure autobiographique soutient l'idée de Conway (2005) que les souvenirs importants pour l'identité personnelle sont maintenus et rappelés plus fréquemment, surtout s'ils sont émotionnellement chargés et visualisés de manière vive. Ce constat pose la question du statut de ces souvenirs sur l'identité de la personne et leur incidence. Autrement dit, se pose la question de l'intégration ou non de ces événements spécifiques à la mémoire autobiographique et son incidence. Point que nous développerons dans notre seconde étude intitulé « Memories of Falls: Resolved or Unresolved Memories? ».

En conclusion, ces résultats ont une double implication : 1) clinique, mieux comprendre comment la personne âgée vit sa chute peut aider à mieux accompagner les personnes âgées chuteurs et ainsi favoriser la rééducation et prévenir la rechute ou la peur de la rechute. 2) théorique, considérer la chute comme un événement isolé semble réducteur puisqu'elle participe à l'identité de la personne (événement spécifique intégré ou non) et influe donc sur son parcours de vie, son autonomie et son bien-être.

5. ARTICLE 2 : Memories of Falls : Resolved or Unresolved Memories ?

L'objet de cet article porte sur la relation entre mémoire et chutes chez la personne âgée, et plus particulièrement sur l'intégration des souvenirs de chute à la mémoire autobiographique. Nous avons cherché dans ce travail de recherche la capacité des personnes âgées à intégrer les souvenirs de chutes dans leur récit de vie et donc leur identité personnelle, et leurs incidences sur le bien-être mesuré en termes de manifestations anxieuses et dépressives. Pour ce faire, le cadre théorique est celui du modèle de Conway (2005) de la mémoire autobiographique.

Autrement dit, il s'agira de déterminer si tous les souvenirs sont intégrés à l'identité personnelle, observable dans leur récit de vie ; ou ces derniers ne sont pas intégrés et constitueraient donc, des points de rupture dans le récit de vie de la personne âgée empêchant la constitution d'un soi cohérent et intégré. Bien que de nombreuses études aient déjà porté sur les causes et les conséquences physiques des chutes chez la personne âgée, un intérêt théorique et clinique croissant existe sur le processus de mémorisation ou d'intégration à la mémoire de ces événements de chute et de leurs incidences sur la santé psychologique. Cette introduction contextualise le cadre et la pertinence de l'étude rapportée dans l'article de Gallouj et al. (2022) « Memories of Falls: Resolved or Unresolved Memories? ».

Ces résultats mettent en lumière l'importance des souvenirs de chute dans la vie des personnes âgées, non seulement comme des expériences émotionnellement marquantes, mais aussi comme des points critiques dans la construction de leur identité personnelle. À travers cette perspective, l'intégration ou l'exclusion de ces souvenirs de la mémoire autobiographique soulève des questions fondamentales sur leur rôle dans le récit de vie et le bien-être psychologique des personnes âgées. Ce point est d'autant plus crucial que les souvenirs non résolus ou non intégrés pourraient entraver la cohérence et l'unité du soi, accentuant potentiellement les manifestations anxieuses ou dépressives. Dans ce cadre, l'article de Gallouj

et al. (2022), intitulé « Memories of Falls: Resolved or Unresolved Memories? », s'inscrit pleinement dans cette réflexion en examinant plus précisément le lien entre l'intégration des souvenirs de chute dans la mémoire autobiographique et leurs implications sur le bien-être psychologique. En poursuivant cette analyse, nous nous interrogerons sur la manière dont ces souvenirs façonnent, ou au contraire fragmentent, l'identité des personnes âgées et leurs trajectoires de vie.

Résumé :

Contexte : Un intérêt croissant se développe autour de la manière dont les personnes âgées se souviennent de leurs chutes, et la recherche dans ce domaine a montré que les chutes peuvent remodeler la récupération des souvenirs chez ces individus. Nous avons poursuivi cette ligne de recherche en évaluant si les personnes âgées réussissent à intégrer les souvenirs de chutes dans leur récit de vie.

Méthodes : Nous avons invité des personnes âgées à se remémorer leurs chutes et avons analysé si ces souvenirs étaient intégrés ou non intégrés.

Résultats : L'analyse n'a révélé aucune différence significative entre le nombre de souvenirs intégrés et non intégrés. Toutefois, de manière critique, une anxiété et une dépression plus élevées ont été observées chez les participants ayant produit des souvenirs non intégrés par rapport à ceux ayant produit des souvenirs intégrés.

Discussion : La capacité à intégrer les souvenirs de chutes chez les personnes âgées semble être associée à l'anxiété et à la dépression. L'anxiété pourrait entraîner un évitement du traitement de la signification des chutes, tandis que la dépression pourrait entraver la capacité à extraire une signification de ces événements, rendant difficile leur intégration dans le récit de vie. Les souvenirs non intégrés de chutes chez les personnes âgées peuvent être considérés comme des souvenirs non résolus et méritent une attention clinique particulière.

Mots clés : vieillissement, anxiété, dépression, chutes, souvenirs des chutes

Memories of Falls: Resolved or Unresolved Memories?

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Running head: memory of falls

Memories of falls: resolved or unresolved memories?

Karim GALLOUJ [1]

Emin ALTINTAS [1, 2]

Mohamad EL HAJ [1, 3, 4]

[1] Unité de Gériatrie, Centre Hospitalier de Tourcoing, Tourcoing, France

[2] Laboratoire PSITEC – Psychologie: Interactions Temps Émotions Cognition, Université Lille Nord de France – 59000 Lille – France

[3] Nantes Université, Univ Angers, Laboratoire de Psychologie des Pays de la Loire (LPPL - EA 4638), F-44000 Nantes, France

[4] Institut Universitaire de France, Paris, France

Correspondence should be addressed to: Mohamad EL HAJ, Faculté de Psychologie, LPPL – Laboratoire de Psychologie des Pays de la Loire, Université de Nantes, Chemin de la Censive du Tertre, BP 81227, 44312 Nantes Cedex 3, France. E-Mail: mohamad.elhaj@univ-nantes.fr

Background: There is bourgeoning interest in how older adults remember their falls and research in this area has demonstrated how falls can reshape memory retrieval in older adults. We pursued this line of research by assessing whether older adults succeed in integrating memories of falls into their life story.

Methods: We invited older adults to remember their falls and analyzed whether these memories were integrated or non-integrated.

Results: Analysis demonstrated no significant differences between the number of integrated and non-integrated memories. Critically, however, higher anxiety and depression was observed in participants who produced non-integrated memories than in those who produced integrated ones.

Discussion: The ability to integrate memories of falls in older adults is likely associated with anxiety and depression. Anxiety may result in avoidance of processing of the meaning of falls, and depression may hamper the ability to extract meaning from them, resulting in difficulties for older adults to integrate falls into their life story. Non-integrated memories of falls in older adults may be seen as unresolved memories and deserve special clinical attention.

Key words*:* aging; anxiety; depression; falls; memory of falls

A major health concern for older adults is falls, as almost a third of people aged 65 and older fall every year (Bergen, 2016; Morrison, Fan, Sen, & Weisenfluh, 2013). Falls in older adults typically result in serious injuries, reduced activity and impaired quality of life, as well as in premature institutionalization (Ambrose, Paul, & Hausdorff, 2013). Falls in older adults is a complex subject, given the variety of risk factors that may predispose them to suffer a fall. These risk factors can be divided into extrinsic and intrinsic factors. Extrinsic risk factors refer to environmental hazards such as slippery floors, inappropriate shoes and poor lighting (Boelens, Hekman, & Verkerke, 2013). Intrinsic risk factors refer to functional and health factors, such as limited muscle strength, sensory limitations, and use of medication (i.e. drugs increasing risk of falls) (Boelens et al., 2013; de Zwart et al., 2015; Deandrea et al., 2010). Intrinsic risk factors of falls also include psychological factors such as cognitive impairment, fear of falls, anxiety, and depression (Boelens et al., 2013; Hallford, Nicholson, Sanders, & McCabe, 2016; Painter et al., 2012; Singh, Bélanger, & Thomas, 2018; Turcu et al., 2004). Falls typically result from a combination of extrinsic and intrinsic factors (Agudelo-Botero, Giraldo-Rodriguez, Murillo-Gonzalez, Mino-Leon, & Cruz-Arenas, 2018; Anderson & Lane, 2020), making their study a complex area and a challenge for gerontology research. The study of falls should thus be viewed from a multifaceted perspective, which may allow better understanding of the complex and interrelated risk factors that lead to falls. The present study pursues a new path in this area, i.e. how older adults integrate their memories of falls. More specifically, we investigate whether older adults succeed in integrating their memories of falls into their life story in order to create meaning and extract relevant learning from falls.

Until recently, little was known about how older adults remember their falls. This issue was addressed in a study in which older adults who had suffered falls prior to the study were invited to remember them and to retrieve control memories (Gallouj, Altintas, & El Haj, 2020). After retrieving falls and control memories, they were invited to rate their emotional valence

(i.e. whether their memories triggered positive or negative emotion), mental time travel (i.e. whether memories triggered strong subjective reliving of the retrieved event), visual imagery (i.e. whether the participants "saw the retrieved events in their mind"), importance (i.e. whether the falls were important to them), and rehearsal (i.e. whether they frequently thought/talked about the falls). In addition, memories of falls and control memories were analyzed regarding specificity (i.e. whether they described a general event or a unique event situated in time and space). Results demonstrated that participants rated memories of falls as more negative, and triggering more mental time travel, more visual imagery, more importance, and more rehearsal than control memories. However, no significant differences were observed between memories of falls and control memories regarding specificity. These results shed light on the strong subjective experience (e.g. high emotion, visual imagery, importance) that is triggered when older adults remember their falls. However, little is known about their ability to integrate falls into their life story.

The present study investigates how older adults integrate memories of falls because memory integration in general reflects the ability to extract meaning from past events, even painful ones, and to integrate these events into one's life story (Blagov & Singer, 2004; El Haj & Gallouj, 2019). Thus, by investigating the integration of the memory of falls, we investigated whether older adults succeed in embedding these events into their life story and in interpreting falls as meaningful to themselves. If so, this would reflect success in updating self-images (e.g. I am getting older after the fall) and personal goals (e.g. I should be careful so that I don't fall again). If detected, successfully integrated memory of falls in older adults might reflect the successful processing of the concerns and difficulties they experience with regard to falls. In contrast, if these memories are not integrated, it might reflect their unsuccessful or rigid processing, with the result that they are viewed as failures, personal weaknesses, arrested narratives or under-narration. If these memories are not integrated, it might mean that older

adults avoid thinking/talking about the events that generated them, even avoiding updating their life story to take their falls into account. If so, this might ultimately result in relapses (i.e. re-falls) due to lack of consideration of the causes/consequences of previous falls. This investigation throws light on whether older adults succeed in stepping back from falls and learning from them and/or even using them to explain changes into their life story or self-images (e.g. That fall shows me that I'm getting weaker).

If older adults are found to experience difficulty in integrating the memories of falls, it might lead to depression and anxiety. Memory integration in general promotes a positive feedback loop that provides additional emotional and motivational value to the memory and reinforces optimism and meaning-making (Singer, Blagov, Berry, & Oost, 2013). Supporting this assumption, research has demonstrated that memory integration is associated with optimism and attainment of goals in young adults (Blagov & Singer, 2004; Singer et al., 2013), with positive self-regard in college students (Debats, Drost, & Hansen, 1995), and even with less grief in bereaved spouses (Bauer & Bonanno, 2001). Furthermore, individuals with a strong tendency to draw lessons about life or integrative meaning from their memories, even painful ones, typically demonstrate optimal levels of adjustment, openness to experience and a successful balance between introversion and extroversion (Staudinger, 1999, 2001). In contrast, failure to integrate memories into one's life story are associated with psychological disorders such as schizophrenia (Berna et al., 2011; Raffard et al., 2009, 2010). We therefore hypothesize that, if detected, the ability of older adults to integrate their memory of falls into their life story could be associated with low depression/anxiety.

We investigated whether older adults succeed in integrating memories of falls. We also investigated whether their ability to do so is associated with anxiety and depression. We expected lower anxiety and depression in older adults who succeed in integrating memories of falls than in those who do not.

Method

Participants

We recruited 44 older adults from medical centers in France. Their mean age was 63.42 years (*SD* = 3.92). The sample included 24 women and 20 men, and no significant differences were observed regarding sex distribution [X^2 (1, N = 44) = .36, p = .55]. Participants were independent and living at home, with normal or corrected-to normal vision and hearing. Inclusion criteria were falls which were defined as an unexpected event in the last six months in which the participant came to rest on the ground, floor, or lower level (Buchner et al., 1993). We implemented this six-month interval to control for the age of the memory (e.g. older adults remember adulthood memories differently from recent ones) (Jansari & Parkin, 1996; Janssen, Rubin, & St Jacques, 2011). Exclusion criteria were a history of psychiatric or neurological disorders. The study was conducted in accordance with the principles laid down by the Helsinki Declaration. All participants provided written informed consent and were free to withdraw from the study should they so wish.

Procedures and materials

In order to ensure that participants were free of cognitive disorders, we tested general cognitive performances, verbal episodic memory and working memory. Besides this cognitive testing, and to test our hypothesis, we tested anxiety/depression as well as memory integration.

Cognitive and clinical performances

Cognitive and clinical performances are shown in Table 1. We evaluated general cognitive functioning with the Mini Mental State Examination (Folstein, Folstein, & McHugh, 1975), assessing domains such as spatiotemporal orientation, memory and language, with a maximum score of 30. We evaluated verbal episodic memory with the Grober and Buschke (1987). Participants were invited to retain 16 words, and after immediate cued recall to proceed

to a 20-second distraction phase during which they had to count numbers aloud. This distraction phase was followed by two minutes of free recall and the recall score (out of a maximum of 16) was retained as the episodic score. We evaluated working memory with the spans task (Miller, 1956). Participants were asked to repeat a string of single digits in the same order (i.e. forward spans) or in the reverse order (i.e. backward spans). Performances referred to the number of correctly repeated digits. We evaluated anxiety and depression with the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). This scale consists of two subscales, each including seven items scored on a four-point scale ranging from 0 (not present) to 3 (considerable). The maximum score of anxiety or depression subscales is 21 points.

INSERT TABLE 1 HERE

Memory retrieval and analysis of integration.

We invited participants to remember their falls. They were asked to describe the fall verbally and to be precise and specific (i.e. to describe where and when it took place, who was there, what they were doing, as well as their feeling as it happened). If the participants experienced several falls, which was the case for four participants, we invited them to retrieve the first fall. Retrieval was recorded with the permission of the participants.

We analyzed memory integration using the procedures designed by Singer et al. (Blagov & Singer, 2004; Singer & Blagov, 2002; Singer & Moffitt, 1992) who proposed a method to assess integration of memories. More specifically, we used the coding instructions of Singer and Blagov (2002) in which integrative memories can be detected through statements that ascribe meaning to the retrieved events. This meaning is typically expressed by statements from subjects describing what a particular event (i.e. the fall) means to them (i.e. the lesson learned from the fall). On the other hand, while non-integrated memories may describe a moment (e.g. the fall occurred at the weekend), place (e.g. the fall occurred in the kitchen), or feelings (e.g. the fall was painful), these memories include only generalizations about the event without

depicting what the event meant to the person or how it conveyed some meaning to their life story. Thus, a memory that describes a generalization (e.g. I was alone during the fall) is non-integrated unless it includes how the fall shaped the individual's perception of her/his life story and self-images (e.g. I understood that I can no longer live alone and that it might be better to live in a home for the elderly). To summarize, we analyzed memories of falls to identify integrated memories, i.e. memories in which older adults step back from the narrative description and generalizations (e.g. describing when and where the fall has occurred) to provide additional statements about its significance or meaning in their life story (e.g. a description of why the fall was important for them). The following example illustrates how memories were anlyzed:

"Last month, at the weekend, I notified water leaking in the kitchen and went to clean up. As I closed the leaking tap and turned around, I slipped over on the wet floor. I fell on my back, hitting the top of my head on the corner of the table. I felt a pain in my back and shoulder and couldn't manage to even move my lift arm. I had to stay to the floor, looking at the ceiling for a time that felt like a lifetime. Once I was able to move, although crawling using my right arm, I managed to grab the phone and call the emergency number. Although my daughter has been doing her best to come by daily, I realized when I was on the floor how I am getting old and weak and that, from now on, I should take her advice to leave the home and live in a home for the elderly. This may, hopefully, reduce my loneliness and allow me to get back in contact with people of my age". This memory depicts how the fall was a turning point in the participant's life (i.e. he considered moving to a home for the elderly after the fall) and how the fall had meaning for his life story (i.e. he realized the extent of his physical weakness and loneliness). This memory was thus considered as an integrated memory.

All memories were rated by two independent judges who followed the coding instructions of Singer and Blagov (2002) and were blind to the hypothesis. We calculated inter-

judge agreement with Cohen's kappa (*K*) (Brennan & Prediger, 1981), demonstrating a substantial agreement score ($K = 0.80$). Cases of disagreement were discussed until a consensus was reached.

Statistical analysis

We compared the number of integrated vs. non-integrated memories (on the total number of memories, $n = 44$, as each participant provided one memory) with Chi square tests. We used the Chi square test because the variable was categorical (integrated vs. non-integrated). Since the "integration" variable was categorical, we were unable to perform correlations with scores of anxiety/depression. Therefore, we used the Student t-test to compare scores of anxiety/depression between participants who retrieved integrated memories and those who provided non-integrated memoires.

Results

No significant differences between integrated vs. non-integrated memories

There were no significant differences between the number of integrated vs. non-integrated memories [X^2 (1, $N = 44$) = .36, $p = .55$, Cohen's $d = .18$] (Table 2).

INSERT TABLE 2 HERE

High anxiety/depression in participants who produced non-integrated memories

Means of anxiety and depression in participants who produced integrated memories and in participants who produced non-integrated memories are shown in Table 3. Anxiety was higher in participants who produced non-integrated memories, $t(42) = 3.29$, $p = .002$, Cohen's $d = .99$. Depression was also higher in participants who produced non-integrated memories, $t(42) = 2.67$, $p = .011$, Cohen's $d = .81$.

We examined whether the two groups differed significantly in their cognitive performance, as described in Table 1. Analysis demonstrated no significant differences

regarding general cognitive functioning [*M* integrated group = 28.40, *SD* = 1.04, *M* non-integrated group = 28.67, *SD* = 1.13, *t*(42) = .81, *p* = .42, Cohen's *d* = .24], episodic memory [*M* integrated group = 10.30, *SD* = 2.58, *M* non-integrated group = 10.79, *SD* = 3.02, *t*(42) = .57, *p* = .57, Cohen's *d* = .27], forward spans [*M* integrated group = 6.55, *SD* = 1.50, *M* non-integrated group = 6.58, *SD* = 1.58, *t*(42) = .07, *p* = .94, Cohen's *d* = .02], or backward spans [*M* integrated group = 4.40, *SD* = 1.35, *M* non-integrated group = 4.79, *SD* = 1.77, *t*(42) = .81, *p* = .42, Cohen's *d* = .42].

INSERT TABLE 3 HERE

Discussion

We evaluated whether older adults succeed in integrating memories of falls into their life story. We observed no significant differences between the number of integrated and non-integrated memories of falls. Critically, higher anxiety and depression was observed in participants who produced non-integrated memories than in those who produced integrated ones. Thus, the ability to integrate memories of falls in older adults is associated with anxiety and depression.

While we did not find any prevalent trend in older adults regarding their ability to integrate memories of falls, this ability is clearly associated with anxiety and depression. The finding that participants who produced non-integrated memories had higher anxiety and depression is important, as it indicates that the latter might impact the integration of memory of falls in older adults. On the other hand, no significant differences were observed between the two groups regarding general cognitive functioning, verbal episodic memory or working

memory. This suggests the existence of an association between the ability of older adults to integrate memories of falls and anxiety/depression.

High anxiety may result in older adults avoiding the processing of the meaning of falls, so they might find it difficult to integrate this into their life story. This assumption is supported by the well-known relationship between anxiety and avoidance, and the key role of avoidance in explaining the etiology and maintenance of anxiety (Asmundson & Taylor, 1996; Dymond & Roche, 2009; Heuer, Rinck, & Becker, 2007). On the other hand, low anxiety may lead to better adjustment, recognition of the potential benefits of falls (e.g. one participant reported that, thanks to the fall, he decided to see his family members more often) and/or to better inhibition of the disturbing emotion that may be associated with falls.

Several factors might explain the association between integration of memories of falls and depression. Depression typically leads to unresolved memories (Williams & Scott, 1988), probably due to difficulties in initiating memory regulation strategies and/or in disengaging from negative ruminations or negative information (e.g. physical pain and psychological distress as experienced during falls). Thus, depression may hamper the ability of older adults to extract meaning from falls and thus hamper integration of these memories into their life story. Although we tend to suggest that depression may lead to non-integrated memories of falls, the reverse can also be true because falls may lead to non-integrated memories and these non-integrated memories may be view as negative events (e.g., failures) leading to depression and anxiety.

Unlike other non-integrated memories, non-integrated memories of falls in older adults may be seen as unresolved memories and deserve special clinical attention. Unlike other memories, non-integrated memories of falls can be associated by older adults with the image of physical failures, dependence, and vulnerability. Critically, memories of falls in older adults can be associated with traumas (Breslau, 2009; Pivar & Field, 2004; Stovall-McClough &

Cloitre, 2003). When a traumatic event is not fully integrated into the life story, some pathological aspects may be observed such as flashbacks. These intrusive memories, as typically observed in post-traumatic stress disorder, can be either physical or emotional and tend to promote alertness and fidgetiness or even avoidance. While unresolved memories of falls cannot be construed as traumatic, they may have lasting consequences and be associated with high anxiety and depression. Older adults could be helped to create a form of relatedness by connecting their falls to previous experiences from which they learned something. Clinicians could also promote a sense of vitality by helping older adults to focus on their dynamism even after their injury (e.g. although I suffered as a result of the fall, I am at least able to keep moving). Raising older adults' awareness about why they fell might also be helpful for those who avoid retrieving memories of falls.

Such therapeutic strategies may be delivered with techniques like Cognitive and Behavioural Therapy (CBT) and Eye Movement Desensitization and Reprocessing (EMDR). While EMDR uses elements of other therapies such as CBT, one of its core aspects is the use of eye movements. It can be particularly efficient in older adults who demonstrate difficulties integrating memories of falls because it focuses on adaptive information processing, i.e. the ability of individuals to assimilate traumatic experiences into their memory networks (Shapiro, 2001). According to the adaptive information processing theory, trauma arises when memories are inadequately encoded and then stored, along with the associated distorted thoughts and emotions, in a maladaptive mode in the memory networks (Shapiro, 2001). The aim of EMDR is to smooth the access to and processing of these traumatic memories by associating them with an adaptive resolution (Shapiro, 2001). Thus, it would be of interest to test clinically whether EMDR can help older adults resolve the issue of their non-integrated memories of falls.

While our study sheds light on the ability of older adults to integrate memories of falls, a limitation is the lack of assessment of fear of falling. Future research should address this issue as older adults who fail to integrate memories of falls may greatly fear falling.

Until recently, little was known about how older adults remember their falls. As demonstrated here, this emerging area of research may provide insights not only into the characteristics of these memories but also into the association between them when they are not adequately processed (e.g. when they are non-resolved/ not integrated into the life story) and into mental health in older adults (e.g. the association between non-integrated memories of falls and anxiety/depression). While this area of research is still in its infancy, future research could probe the potential effects of memories of falls on relapse as well as on the potentially positive effects of therapy on these memories, when triggering negative content.

Declaration Of Interest Statement

The authors declare that they have no conflict of interest.

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Table 1

Cognitive and clinical characteristics of participants

Domain	**Task**	Means
General Cognitive functioning	Mini-Mental State Examination	28.55 (1.08)
Episodic memory	Grober & Buschke	10.57 (2.81)
Working memory	Forward span	6.57 (1.53)
	Backward span	4.61 (1.56)
Anxiety	Hospital Anxiety and Depression Scale	8.27 (3.81)
Depression	Hospital Anxiety and Depression Scale	8.93 (3.37)

Note. Standard deviations are given in parentheses; the maximum score on the Mini-Mental State Examination was 30 points; the maximum score on the Grober and Buschke task was 16 points; performance on the forward and backward spans was the number of correctly repeated digits; the maximum score on the anxiety or depression subscales of the Hospital Anxiety and Depression Scale was 21 points.

Table 2

Number of integrated and non-integrated memories of falls

Integrated memories	Non-integrated memories
20	24

Table 3

Mean anxiety and depressions scores in participants who produced integrated memories of falls and those who produced non-integrated ones

	Integrated memories	Non-integrated memories	*p*
Anxiety	6.40 (3.20)	9.83 (3.63)	.002
Depression	7.95 (2.06)	9.75 (2.34)	.011

Note. Standard deviations are given in parentheses; maximum score on anxiety or depression subscales as assessed with Hospital Anxiety and Depression Scale was 21 points.

Synthèse des résultats principaux de l'article :

Nos résultats, par l'étude des récits de vie, retrouvent des souvenirs de chute intégrés et non-intégrés chez les personnes âgées chuteurs. Les deux types de souvenirs sont retrouvés en mémoires autobiographiques des chuteurs mais pour partie ces souvenirs sont intégrés, une autre partie ne l'est pas. En outre, les souvenirs de chute non-intégrés sont associés significativement à de plus fortes manifestations anxieuses et dépressives. Le modèle de Conway (2005) de la mémoire autobiographique permet d'interpréter la non-intégration de ces souvenirs de chute à l'identité personnelle comme une source potentielle de perturbation de l'identité personnelle. En effet identifié grâce au récit de vie, les souvenirs non-intégrés constituent des points de rupture voire de fragilité rapportée dans le récit de vie indiquant un soi moins cohérent, moins intégré source de perturbation de la santé psychologique.

Ces résultats soulignent l'importance de la manière dont les souvenirs des chutes sont intégrés dans l'identité personnelle des personnes âgées chuteurs. La relation observée entre les souvenirs non intégrés et les niveaux élevés d'anxiété et de dépression suggère que l'intégration des souvenirs de chutes pourrait jouer un rôle crucial dans le bien-être psychologique des individus. L'intégration des souvenirs de chutes pourrait donc être vue comme un processus thérapeutique potentiel pour atténuer les symptômes d'anxiété et de dépression chez les personnes âgées. En effet, la capacité à extraire du sens des événements passés, même douloureux, et à les intégrer dans l'histoire de vie personnelle semble être associée à une meilleure santé mentale et à une résilience accrue.

L'étude de Gallouj et al. (2022) apporte des contributions significatives à notre compréhension des souvenirs de chutes chez les personnes âgées. Cette étude souligne l'importance de considérer les souvenirs de chutes non pas comme des événements spécifiques isolés, mais comme des événements alimentant le récit de vie et l'identité personnelle. Par

conséquent, l'intégration de ces souvenirs constitue un enjeu majeur chez les chuteurs dans l'accompagnement clinique, la rééducation voire la prévention. Cette étude ouvre d'une part la voie sur des études portant sur les interventions thérapeutiques pouvant atténuer les impacts négatifs de ces souvenirs, et ainsi améliorer la santé psychologique des personnes âgées confrontées à des chutes. Et d'autre part, elle ouvre la voie à une nécessaire modélisation théorique.

6. ARTICLE 3: Unraveling the Memory of Falls in Older Adults : a Scoping Review

Cette série de travaux, dont la portée est prometteuse dans le contexte particulier du chuteur âgé, apporte une lecture novatrice de la chute par son inscription en mémoire autobiographique et sa contribution singulière à l'histoire de vie de l'individu. Cette histoire inscrite dans l'identité personnelle, dont l'objectif est cohérence et intégrité dans le but de maintenir l'équilibre et la santé psychologique.

Ce pattern optimal ou idéal n'est malheureusement pas la règle. En effet, la clinique est là pour nous montrer l'existence de chuteurs âgées envahis par la peur de la rechute dont la manifestation la plus courante est le syndrome post-chute.

Les résultats obtenus mettent en évidence l'importance de l'intégration des souvenirs de chutes dans la mémoire autobiographique, soulignant leur rôle clé dans la construction et le maintien d'une identité personnelle cohérente chez les personnes âgées chuteurs. Cependant, comme le montre la clinique, tous les chuteurs ne parviennent pas à cette intégration optimale. Les souvenirs non intégrés peuvent exacerber des manifestations d'anxiété et de dépression, contribuant à des points de rupture dans le récit de vie et fragilisant l'équilibre psychologique de ces individus. Cette dynamique peut mener au développement de syndromes post-chute, où la peur de la rechute envahit la vie quotidienne.

Dans cette perspective, nous proposons d'aller au-delà de la simple observation clinique pour élaborer un modèle théorique et clinique éclairant la peur de la rechute à travers le prisme de la mémoire autobiographique. À partir des résultats de nos travaux et de la littérature existante, nous introduirons l'hypothèse MEMFA (Mémoire de la Chute chez la Personne Âgée), qui vise à expliquer, décrire et caractériser ce phénomène. Cette hypothèse s'inscrit dans

une démarche intégrative, liant théorie et pratique clinique, afin de mieux comprendre et accompagner les personnes âgées confrontées aux défis psychologiques et identitaires liés aux chutes.

Dans la suite de ce document, nous allons nous employer à formaliser, à la lumière des résultats de nos recherches et de la littérature, une proposition de modèle « théorique et clinique » qui tentera d'expliquer, décrire et caractériser la peur de la rechute chez la personne âgée par le prisme de la mémoire autobiographique. Pour ce faire, nous défendrons dans ce manuscrit l'hypothèse MEMFA de la mémoire de la chute chez la personne âgée.

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Short title: Memory of falls

Falling into Memory: Unraveling Memory of Falls in Older Adults : A scoping review.

Karim GALLOUJ [1,2]

Emin ALTINTAS [1, 2]

Mohamad EL HAJ [3]

[1] Unité de Gériatrie, Centre Hospitalier de Tourcoing, Tourcoing, France

[2] Laboratoire PSITEC – Psychologie: Interactions Temps Émotions Cognition, Université Lille Nord de France – 59000 Lille – France

[3] CHU Nantes, Clinical Gerontology Department, Bd Jacques Monod, F44093, Nantes, France

Correspondence should be addressed to: Mohamad EL HAJ, Faculté de Psychologie, LPPL – Laboratoire de Psychologie des Pays de la Loire, Université de Nantes, Chemin de la Censive du Tertre, BP 81227, 44312 Nantes Cedex 3, France. E-Mail: mohamad.elhaj@univ-nantes.fr

Despite abundant research on falls in older adults, studies on memory of falls are rare. Important issues not yet addressed include how older adults remember falls and whether these memories shape their life stories. The present paper describes the MEMFA (MEMory of Falls in Aging) hypothesis, which we formulated to explain why older adults successfully integrate some memories of falls, but not others, into their life stories. According to the MEMFA hypothesis, memories of falls in older adults are highly specific and vivid, trigger reliving, and often have negative emotional valence. These characteristics, especially the negative emotional valence, when mediated by anxiety and/or depression, hinder older people's ability to extract meaning from falls, resulting in unsuccessful integration of these memories and, ultimately, a fear of

falling. By providing a framework for studying memory of falls, the MEMFA hypothesis will give rise to new insights into older adults' psychological well-being and inform future interventions.

Keywords: aging; autobiographical memory; falls; memory; memory of falls

1. Introduction

Do older adults retain vivid autobiographical memories of falls? Do they process these memories differently compared to other autobiographical memories? Do memories of falls play a role in shaping older adults' life stories and self-images? Do memories of falls help create a fear of falling and subsequently increase the risk of falls? These questions underscore the importance of investigating memory of falls in older adults. The present theoretical study drew on current knowledge of older adults' memories of falls to construct a theoretical framework for exploring the phenomenon's meaning. The resulting hypothesis, which we entitled MEMFA (MEMory of Falls in Aging), suggests that investigating memory of falls may shed light both on memory processes and on falls in older adults. We begin by reviewing the literature on autobiographical memory, on falls in older adults, and on memory of falls in older adults. We then present the MEMFA hypothesis and discuss its clinical and experimental implications.

1.1. Methodology

Although the MEMFA hypothesis arose primarily from two experimental papers published by our lab, it was formulated in the light of an extensive review of the relevant literature. In line with PRISMA guidelines, the literature search covered several databases, including Medline (PubMed), Scopus, Web of Science, and Google Scholar, and used a combination of keywords, including "aging," "autobiographical memory," and "falls." We also examined the included articles' bibliographies to identify additional relevant studies.

2. Autobiographical memory in older adults

Autobiographical memory differs from other memory systems in that it raises not only the basic question of what we remember but also the issues of how and why we remember (El Haj, 2023). Autobiographical memory is a dynamic system that incorporates multimodal representations of personal experiences and allows for the retrieval and potential distortion of these representations so they align with self-concepts, social contexts, or specific goals (Conway, 2005; Rubin, 2005). Tulving (2002) identified two components of autobiographical memory: episodic memory and semantic memory. Semantic memory involves retrieving factual

knowledge abstracted from the context in which it was acquired, whereas episodic memory pertains to the recollection of specific events situated in time and space. Episodic retrieval enables individuals to mentally transport themselves to past experiences or to envision future scenarios, a phenomenon known as autonoetic consciousness. Its converse, noetic consciousness, involves a more abstract sense of time and less vivid phenomenological experiences and forms the root of semantic memory (Tulving, 2002). Compared with autonoetic consciousness, noetic consciousness involves less phenomenological experience and consists of subjective and emotional elements, as well visual imagery, that is, the ability to create mental representations of retrieved events (El Haj, 2024; El Haj & Antoine, 2017; El Haj et al., 2021). Autobiographical memory contributes to a person's life story and sense of self, but there is evidence that episodic autobiographical retrieval declines with age.

Indeed, aging is generally associated with declines in both working memory and episodic memory, but not in semantic memory or procedural memory (Nilsson, 2003). Episodic retrieval in autobiographical memory also declines in normal aging, whereas semantic memories remain intact (Addis, Wong, & Schacter, 2008; El Haj, Clément, Fasotti, & Allain, 2013; El Haj, Fasotti, & Allain, 2012; El Haj, Postal, & Allain, 2012; Habermas, Diel, & Welzer, 2013; Piolino et al., 2006, 2010; Piolino, Desgranges, Benali, & Eustache, 2002; St. Jacques & Levine, 2007). Thus, many older adults can recall fewer specific episodic details and more semantic information, which is detached from spatio-temporal contexts, during autobiographical retrieval. Neuroimaging studies suggest that older adults' difficulties in retrieving specific autobiographical memories may be related to changes in pre-frontal cortex functioning (Levine et al., 2002; Maguire, 2001) and associated with older adults' diminished autonoetic experiences during remembering (Piolino et al., 2006). However, older adults are good at retaining memories that are relevant to identity processes (El Haj & Allain, 2020; El Haj et al., 2015; Martinelli et al., 2013; Singer et al., 2007). Due to their importance to people's life stories and identities, these self-defining memories may enable older adults to overcome difficulties in specificity. Additionally, older adults tend to exhibit successful regulation of the emotional load of autobiographical memories (El Haj et al., 2020; El Haj et al., 2023). This emotional regulation reflects the "positivity effect" phenomenon, where normal aging is associated with a tendency to favor positive stimuli over negative stimuli (Carstensen et al., 1999; Carstensen et al., 2011). Overall, even though normal aging is linked with decreased retrieval of episodic autobiographical information, older adults demonstrate successful emotional regulation and intact retrieval and integration of meaningful autobiographical memories—processes that help foster a clear and stable sense of self. Before discussing research

on memory integration in the case of older adults' memories of falls, it is useful to describe the characteristics of falls in older adults.

3. Falls in older adults

Falls are a major cause of accidental death and nonfatal injuries in people over 65 years old (Del Brutto et al., 2019; Delbari et al., 2024; Dhargave & Sendhilkumar, 2016; Salari et al., 2022). Falls can lead to serious problems for older adults, including injury-related, physical, and psychological difficulties (King & King, 2010), reduced quality of life (Park, 2018), and social isolation (Thomas et al., 2022). Furthermore, falls are a major worry for older adults, as they often result in them being referred to nursing homes. There are innumerable intrinsic (individual-related) and extrinsic (environmental) risk factors for falls (American Geriatrics, 2001; Boelens et al., 2013; Ooi et al., 2021). Intrinsic factors include medical history, age, gender, living arrangements, mobility limitations, sensory impairments, and psychological factors, as well as a previous history of falls or a fear of falling (American Geriatrics, 2001; Olubusola et al., 2023; Singh et al., 2018). Extrinsic risk factors include environmental conditions (e.g., poor lighting, slick floors, slippery bathrooms), inappropriate footwear, and unsuitable walking aids (Olubusola et al., 2023; Vu et al., 2020). Falls generally result from a combination of risk factors rather than a single cause (Olubusola et al., 2023). Whatever their cause, falls create serious physical and emotional challenges for older adults and may evoke vivid autobiographical memories.

4. Memory of falls in older adults

Although there is a wealth of research on autobiographical memory in older adults and an even larger literature on falls in older adults, few studies have investigated older adults' memories of falls. The first published study on this subject compared older adults' memories of falls they had experienced with their ability to retrieve memories not related to falls (Gallouj et al., 2023). Participants rated all memories in terms of emotions (i.e., whether memories triggered positive or negative emotions), mental time travel (i.e. whether memories triggered strong subjective reliving), visual imagery (i.e., whether memories triggered vivid mental images), importance (i.e. whether the memories were important), and rehearsal (i.e. whether they frequently thought/talked about the retrieved memories). The study also assessed the specificity of fall-related and non-fall-related memories, distinguishing between general events and specific events tied to specific times and places. Compared with non-fall-related memories, memories of falls were characterized by greater negativity, increased mental time travel, more

vivid visual imagery, greater perceived importance, and more frequent rehearsal. However, there were no significant differences in the specificity of fall-related memories and non-fall-related memories. These findings underscore the intense and subjective nature of older adults' memories of falls and highlight the heightened emotional responses, detailed visual imagery, and perceived significance attached to these events.

The same team of researchers also explored how older adults incorporate memories of falls into their life narratives (Gallouj et al., 2022). To this end, they asked participants to recall falls they had had and then evaluated these memories for integration, assessed in terms of whether participants provided additional statements about the fall's significance or meaning within their life stories. Results did not reveal a significant difference in the number of integrated versus non-integrated memories, but participants with non-integrated memories reported higher levels of anxiety and depression compared to those with integrated memories. This suggests that anxiety may lead individuals to avoid processing the meaning of falls, while depression may impede the extraction of meaning from these experiences. Consequently, older adults' ability to integrate memories of falls into their life narratives may be influenced by their levels of anxiety and depression, with non-integrated memories possibly indicating unresolved issues requiring clinical attention. Taken together, findings from the few studies to have investigated older adults' memories of falls (Gallouj et al., 2022, 2023) suggest that falls may shape autobiographical retrieval in older adults. These findings form the basis for the MEMFA hypothesis, presented below.

5. The MEMFA hypothesis

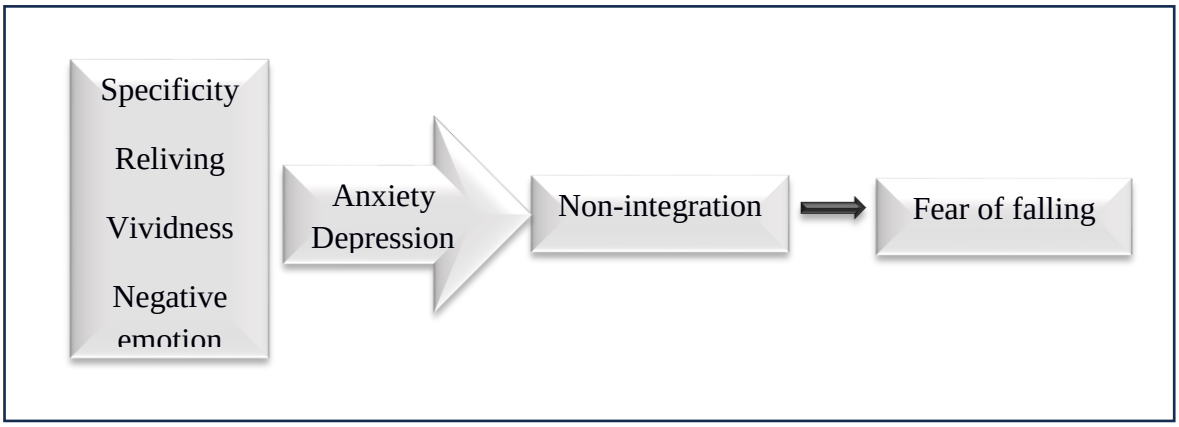
The MEMFA hypothesis sheds light on the unique nature of memories of falls, which are characterized by high levels of specificity and are retrieved in specific times and places. Memories of falls evoke strong subjective experiences, allowing older adults to vividly re-experience them and retrieve them from a field perspective (i.e., as viewed through their own eyes). These vivid, subjective experiences often have a negative emotional valence due to the physical difficulties and pain that falls may produce and/or from the consequences of falls, such as injuries, loneliness, dependency, or even institutionalization. This negative emotional content may prevent older adults successful integrating these memories into their life stories. Unintegrated memories of falls are associated with higher levels of anxiety and depression in older adults. Thus, memories of falls in older adults are often specific, trigger strong subjective experiences, and have a negative emotional valence which, when associated with anxiety and/or depression, can prevent older adults integrating these memories into their life stories.

Memories of falls are unique because they involve events of great importance for older adults. Many older adults, especially those who fail to integrate these memories into their life stories, may consider a fall a turning point in their lives, seeing it as a sign of physical fragility, imminent dependence on others, and, potentially, institutionalization. Moreover, falls may trigger negative shifts in self-image as they may lead older adults to integrate negative images of the self. These negative images may encompass physical images (e.g., I am weak, I am sick), psychological images (e.g., I am fragile, I am vulnerable), and/or social images (e.g., I am alone, I am dependent). Ultimately, the negative valence of memories of falls may lead to a fear of falling and subsequent falls, especially if these memories remain unintegrated. Anxiety and avoidance, which may be associated with negative/unintegrated memories of falls, may lead to weak adjustment and/or unsuccessful processing of the associated disturbing emotions. Depression may have a similar effect, as it often results in memories being unresolved (Williams & Scott, 1988) because it can hinder successful memory regulation strategies and/or prevent people disengaging from negative ruminations or negative information (e.g., physical pain and psychological distress experienced during falls). It is noteworthy that falls are typically associated with anxiety and depression (Hallford et al., 2016; Painter et al., 2012; Singh et al., 2018; Turcu et al., 2004). The MEMFA hypothesis postulates that anxiety and depression can hamper older adults' ability to extract meaning from falls and thereby prevent them successfully integrating these memories into their life stories. This can result in a failure to process memories of falls and ultimately lead to a fear of falling.

The MEMFA hypothesis can be summarized as follows: Memories of falls in older adults are highly specific and vivid, trigger reliving, and often have negative emotional valence. These characteristics, especially the negative emotional valence, when mediated by anxiety and/or depression, hinder an older person's ability to extract meaning from falls, resulting in unsuccessful integration of these memories and, ultimately, a fear of falling (Figure 1). We put forward the MEMFA hypothesis as a framework for developing understanding of why memories of falls can be problematic for older adults. This is important because Gallouj et al. (2022) did not find any significant difference in the number of integrated versus non-integrated memories of falls in older adults. In terms of their high specificity, reliving, vividness, and negative emotional valence, older adults' memories of falls have certain similarities with traumatic memories, which also tend to be negative and very vivid (Conway, 2005; Rubin, 2005; Shin et al., 1997). Nevertheless, older adults can successfully process memories of falls if these memories are not associated with high levels of anxiety and/or depression.

Figure 1

According to the MEMFA hypothesis, memories of falls in older adults highly specific and vivid, trigger reliving, and often have negative emotional valence. These characteristics, especially the negative emotional valence, when mediated by anxiety and/or depression, hinder an older person's ability to extract meaning from falls, resulting in unsuccessful integration of these memories and, ultimately, a fear of falling.



6. Discussion

Although there is a wealth of research on autobiographical memory in older adults and an even larger literature on falls in older adults, few studies have investigated memory of falls in older adults. However, further investigation of this under-researched issue would provide valuable insights into questions such as how older adults remember falls and whether these memories shape their life stories. The MEMFA hypothesis synthesizes current research on memory of falls in older adults to explain why these memories can be problematic.

Further research on the characteristics of older adults' memories of falls is needed to improve our understanding of the psychological consequences of falls and provide insights into the dynamics of changes in autobiographical retrieval during aging. Older adults' autobiographical retrieval is generally associated with diminished specificity and subjective experiences. Research on the characteristics of older adults' memories of falls may indicate how older adults retain strong memories of falls, despite this diminished autobiographical retrieval, and why memories of falls often have a negative emotional load for older adults, even though they are able to successfully regulate the emotional load of autobiographical memories (El Haj et al., 2020; El Haj et al., 2023). The effects of memories of falls on the fear of falling

is another important issue requiring further investigation. Although there is empirical evidence supporting the MEMFA hypothesis's postulated link between the characteristics of memories of falls and both anxiety and depression, the putative relationship between these memories and fear of falling is speculative. The MEMFA hypothesis maintains that unintegrated memories of falls can give rise to avoidance and weak regulation of the associated negative emotions and thereby lead to a fear of falling. Empirical research is needed to test this proposition by, for example, investigating whether memories of falls can act as reinforcing agents for the fear of falling. Older adults who experience falls, especially those with heightened anxiety, may become particularly concerned about falling in the future and therefore enter a cycle of avoidance behaviors and fear. In addition, memories of falls may contribute to cognitive biases, such as catastrophizing or overestimating the likelihood of future falls, that can amplify older adults' fear of falling.

The MEMFA hypothesis also provides a framework for clinical research. For example, it would be interesting to examine whether psychotherapy techniques, such as reminiscence, can help older adults create a form of relatedness by connecting falls to previous events during which they successfully coped with challenges. Clinicians could try to promote a sense of vitality by helping older adults to focus on their vigor even after their falls (e.g., although I suffered, I can still move). Therapeutic techniques that promote adaptive information processing, such as cognitive and behavioral therapy and eye movement desensitization and reprocessing, are also worth investigating as ways of helping older adults to integrate problematic memories of falls.

7. Conclusion

As humans age they go through internal and external transformations aimed at adapting to changing environments. Thanks to advances in medical science and technology, ever larger numbers of people are living to older ages. But aging is often accompanied by health problems, including falling, that can lead to morbidity and substantial healthcare costs, if not death. Despite extensive research on falls in older adults, little is known about how they recall these incidents. By providing a framework for studying memory of falls in older adults, the MEMFA hypothesis will give rise to new insights into older people's psychological well-being and inform future interventions. Understanding the intricacies of memory of falls is crucial both for addressing individual experiences and for tailoring public health strategies to the needs of aging populations.

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Résumé de l'article

L'hypothèse du modèle MEMFA se concentre sur la façon dont la personne âgée à intégrer à son histoire de vie, son identité personnelle, l'expérience de la chute. Pour ce faire, le récit de vie, le souvenir de la chute est un facteur primordial. Dans ce cadre, l'hypothèse MEMFA tente d'expliquer pourquoi certains événements spécifiques de chutes sont parfaitement intégrés à l'histoire de vie, ne perturbent pas l'intégrité et la cohérence en mémoire autobiographique. Pour dire plus simplement, ces événements de chute font sens dans l'identité personnelle. Alors que d'autres souvenirs de chute donnent lieu à des réviviscences à valence émotionnelle négative et des manifestations anxieuses et dépressives, freins à l'extraction de sens dans ces souvenirs, et limite ainsi ou empêche la bonne intégration en mémoire autobiographique et du coup mènent à l'émergence d'une peur de la rechute.

Le cadre théorique de lecture proposé par le modèle MEMFA met au centre du processus de chute l'intégration des souvenirs de chute à la mémoire autobiographique. Tout défaut d'intégration serait synonyme de peur de la rechute, d'absence de sens perturbant ainsi l'intégrité et la cohérence de l'identité personnelle en lien avec cet événement spécifique qu'est la chute. Dans ce modèle, les manifestations anxieuses et dépressives seraient médiatrices dans cette séquence menant à la peur de la rechute. Il est essentiel de comprendre les caractéristiques et les effets des souvenirs de chute pour mettre au point des interventions visant à améliorer la santé psychologique et la qualité de vie des personnes âgées. Ce cadre théorique suggère des applications cliniques potentielles, telles que des techniques de psychothérapie pour aider la personne âgée à traiter et à intégrer plus efficacement les souvenirs de chute, réduisant ainsi l'anxiété, la dépression et la peur de tomber.

7. DISCUSSION ET IMPLICATIONS CLINIQUES

La chute chez la personne âgée est très clairement une problématique majeure de santé publique. C'est tout d'abord une urgence médicale en raison des conséquences traumatiques initiales (ex : fracture, traumatisme crânien). Cette première chute que j'étiquetterai comme un événement spécifique aigu, traumatique, se transforme très rapidement en une véritable pathologie chronique.

Pourquoi une personne âgée qui a chuté une fois, chutera à nouveau de façon inéluctable dans les jours et les semaines qui suivent ? Pourquoi malgré l'adaptation du domicile, du chaussage, de l'utilisation d'aides techniques adaptées, la personne âgée va chuter à nouveau. Pourquoi les programmes de rééducation à la marche, de prévention des chutes ne semblent efficaces que pour une durée limitée (6 à 18 mois) ? Nous avons développé tout au long de ce document le rôle central de la mémoire autobiographique dans le rapport de l'individu à son environnement par l'intermédiaire de son corps, idéalement en mouvement pour interagir effacement avec ce dernier. Elle est constituée d'un réseau complexe d'événements passés qui façonnent la perception de soi, et assure notre continuité dans le temps. Elle permet de consigner en mémoire les différents événements de vie, de les intégrer dans l'histoire de vie de l'individu. Certains événements de vie spécifique peuvent ne pas être intégrer à notre Soi, à notre mémoire autobiographique, et constituer une source de conflit pouvant menacer l'intégrité physique ou psychologique de l'individu et donc l'intégrité du soi. Pour les personnes âgées, cette mémoire joue un rôle encore plus crucial dans la structuration de leur identité, notamment face aux événements de la vie marquée par des bouleversements physiques et psychologiques. Pour ce qui est des souvenirs de chute, la résurgence fréquente de souvenirs douloureux pourrait entretenir la peur de la rechute et favoriser la rechute. Cet événement spécifique, souvent vécu

avec une forte charge émotionnelle, peut être perçu comme un tournant critique, notamment à cause de ses répercussions physiques et psychologiques sur le bien-être des personnes âgées. Les chutes chez les personnes âgées sont largement étudiées sous l'angle médical et physique. Cependant, leur inscription dans la mémoire autobiographique et leur rôle dans la construction de l'identité personnelle reste un domaine peu exploré. Ce travail de recherche vise à combler ce vide, en interrogeant les mécanismes par lesquels les souvenirs de chutes sont intégrés ou non dans la mémoire autobiographique des personnes âgées, et comment ces processus influencent leur bien-être psychologique.

Cette thèse se fonde sur le modèle de la mémoire autobiographique de Conway (2005), qui postule que certains souvenirs, notamment ceux chargés émotionnellement, sont plus susceptibles de jouer un rôle central dans la continuité du soi. Nous avons analysé comment les souvenirs de chutes se distinguent d'autres types de souvenirs en termes de valence émotionnelle, de visualisation et de leur influence sur l'identité. Les souvenirs de chute, en raison de leur charge émotionnelle et de leur importance pour la perception de soi, pourraient donc jouer un rôle central dans la mémoire autobiographique des personnes âgées.

L'apport de ce document est à deux niveaux, le premier sur le plan théorique en lien avec le modèle de CONWAY et le second est plus clinique. Nos résultats confirment que 1- les souvenirs de chutes sont rappelés plus fréquemment que les souvenirs d'autres événements, 2- les souvenirs non intégrés sont significativement associés à des niveaux plus élevés d'anxiété, de dépression et à une peur accrue de la rechute, 3- L'intégration réussie des souvenirs de chute dans la mémoire autobiographique est associée à un meilleur bien-être psychologique et à une plus grande résilience. Ces résultats renforcent l'hypothèse du modèle MEMFA, selon laquelle l'intégration des souvenirs de chute dans la mémoire autobiographique joue un rôle crucial dans la gestion psychologique de l'événement et dans la prévention de la peur de la rechute. Le modèle MEMFA, développé récemment par Gallouj et al. (2025), propose que l'intégration ou

non des souvenirs de chutes dans la mémoire autobiographique des personnes âgées est un facteur déterminant pour leur bien-être psychologique. Les souvenirs non intégrés sont associés à des niveaux plus élevés d'anxiété et de dépression, tandis que les souvenirs intégrés semblent soutenir une meilleure adaptation à l'événement spécifique (ex : la chute).

Les résultats soulignent l'importance de l'intégration des souvenirs de chute dans la mémoire autobiographique pour maintenir une identité cohérente et stable. Lorsque ces souvenirs sont bien intégrés, ils semblent favoriser l'adaptation du chuteur et permettent à l'individu de mieux gérer les conséquences physiques et psychologiques des chutes. En revanche, les souvenirs non intégrés créent une rupture dans la continuité de l'identité, provoquant des troubles psychologiques tels que l'anxiété et la dépression mais également favorise la peur de la rechute mais également les chutes elles-mêmes. L'intégration des souvenirs de chutes à la mémoire autobiographique est un processus essentiel au maintien à la continuité du soi, à l'adaptation à cette événement de vie spécifique et traumatique mais également au bon déroulé de la période post-chute : rééducation et prévention de la rechute. En caractérisant les processus de traitement des souvenirs de chute en mémoire autobiographique à la lumière du modèle de Conway (2005) et de l'hypothèse MEMFA, de nouvelles voies de prise en charge et d'accompagnement émergent. Il est possible d'intervenir à deux niveaux : 1- au niveau des symptômes post-chute (ex : anxiété / dépression) et 2- au niveau de la composante émotionnelle de la chute. L'objectif est de revisiter le souvenir en mémoire afin de favoriser son intégration à l'identité de la personne et assurer la continuité du soi. L'objectif final serait d'amener ce souvenir à devenir une réminiscence narrative voire intégrative et pour cela quatre pistes d'intervention émergent :

- L'intervention psycho-éducative (à deux moments avant / après la chute – hôpital de jour)

Prévenir les chutes épargnerait grandement les patients âgés et leur famille par la préservation de leur autonomie. Un des axes de prévention serait la psychoéducation du patient,

de son entourage à la chute et ses facteurs précipitants. Ainsi, la promotion de l'autonomie passerait par l'information, la sensibilisation et la responsabilisation du patient et de son entourage sur les risques et les stratégies à adopter et mettre en place pour prévenir les chutes.

Ce travail de psychoéducation et d'accompagnement des populations à risque s'organiserait autour de sept points pouvant constituer un programme de prévention de la chute : 1- Décrire et expliquer les facteurs de risque de la chute (ex : âge et mobilité, prise de médicaments, environnement domestique, …) , 2- Modification et adaptation des comportements et habitudes (ex : exercices physiques adaptés, adapter l'alimentation, …), 3- Aménager l'environnement au domicile (ex : évaluation des risques au domicile, adaptation ergonomique du lieu de vie, …), 4- Gestion de la peur de la rechute (ex : travailler sur les préjugés, la confiance, entrainement à la relaxation, …), 5- Sensibilisation et implication de l'entourage (ex : former à la chute, former au repérage des signes de fragilité, …), 6- Mise en place d'aides techniques (ex : cannes, déambulateur, lit adapté, …), 7- Formation à la chute (ex : formation à comment tomber ?, que faire en cas de chute ?, …).

- La thérapie par les mouvements oculaires (EMDR – émotions relié à la chute et une éventuelle opération chirurgicale)

L'EMDR (Eye Movement Desentizitization Reprocessing) est une technique psychothérapeutique développée par Francine Shapiro pour traiter les évènements de vie traumatiques. Cette technique repose sur le principe d'une réactivation d'une expérience traumatique non traitée afin de dissocier ou réduire la composante émotionnelle associée. Par une stimulation sensorielle, en général visuelle, répétitive et monotone, un état de conscience légèrement modifié est généré, similaire à celui qui se produit en sommeil paradoxal. Cet état de conscience permet le retraitement de l'évènement traumatique et particulièrement de la composante émotionnelle en diminuant la charge émotionnelle associée.

L'EMDR constitue ainsi une technique innovante et efficace pour le traitement des chutes, traumatiques, donc non-intégrés à l'histoire de vie et à la mémoire autobiographique. Retraiter le souvenir de la chute réduirait la charge émotionnelle. Cette voie d'accompagnement de la personne âgée chuteur gagnerait à être développer dans l'optique de réduire la rechute.

- La thérapie narrative (médecine narrative / thérapie narrative)

La thérapie narrative initialement développée par White & Epston (REF) repose sur une approche collaborative et l'idée de renforcer l'identité narrative de l'individu par le récit de son histoire de vie. L'objet central est la recherche de sens au sein des différents événements de vie qui constituent l'identité de l'individu et compose son histoire de vie. Cette construction du récit de vie par l'individu peut être marquée par des évènements caractérisés par l'échec, le désespoir et le sentiment d'impuissance telle que dans une chute. L'objectif de la thérapie narrative est d'externaliser ces évènements, explorer et tester des « histoire alternatives » et ainsi encourager et accompagner la construction d'une histoire mieux intégrée à l'identité et l'histoire de vie de la personne âgée chuteur.

- La thérapie cognitivo-comportementale (axée anxiété/dépression voire syndrome post-chute, peur de la rechute et composante émotionnelle de la rechute)

Les thérapies cognitivo-comportementales (TCC) appliquées au contexte de la chute de la personne âgée ambitionne de réduire et de rendre supportable la peur de la rechute et ainsi prévenir une nouvelle chute. Cette population à risque animée par des pensées, des croyances dysfonctionnelles de type « J'ai peur de tomber », « Si je tombe, je ne me relève pas » qui réduisent son autonomie, altère sa confiance et limite ainsi son bien-être. Le postulat de la TCC est d'identifier ces croyances et de limiter sa portée par une restructuration cognitive qui consiste à mettre ces croyances dysfonctionnelles à l'épreuve des faits et de la réalité par

restructuration cognitive et exposition graduelle. L'objectif thérapeutique est de progressivement remplacer ces pensées dysfonctionnelles par des pensées positives et réalistes. L'installation de ces dernières serait favorisée par un renforcement comportemental de type activation comportementale, par exemple. Au final, une diminution de la peur de la rechute, une amélioration de l'équilibre et de la mobilité ainsi qu'une diminution des comportements d'évitement (ex : syndrome post-chute) seraient retrouvés comme principaux bénéfices, probablement synonyme ou témoin d'une meilleure intégration des précédentes chutes à la mémoire autobiographique.

8. LIMITES ET OUVERTURE :

Deux principales limites peuvent être formuler à l'encontre de ce travail de recherche : 1- la réalisation de nos recherches sur des populations réduites limite la généralisation des résultats à la population générale et nécessite une réplique, 2- l'utilisation de protocole transversaux limite également la généralisation des résultats et la portée de nos travaux. Dans un souci de répondre à ces limites mais également continuer ce travail de recherche dont nous sommes convaincus de la portée clinique, nous proposons un premier projet de recherche que nous sommes en train de mettre en place dans nos consultations de HDJ (Hôpital de jour).

Nous avons pour objectif à moyen terme de réaliser une étude avec l'objectif de déterminer si la caractérisation du souvenir de la chute (intégré vs non intégré) chez la personne âgée permet de prédire les rechutes. Pour ce faire, nous comptons réaliser une étude longitudinale à deux mesures sur une période de six mois. Au temps 1, nous mobiliserons deux groupes (chuteurs vs non chuteurs) il s'agira d'identifier un souvenir spontanément et librement choisi pour le groupe contrôle. Ce dernier sera comparé au souvenir de la chute pour le groupe

chuteur. Au temps 2, après une période de six mois le nombre de chute sera recensé pour les deux groupes.

Les groupes de participants chuteurs et non chuteurs seront recrutés parmi les patients suivis en hôpital de jour gériatrique du Centre Hospitalier Dron de Tourcoing. Les évaluations seront à la fois qualitatives et quantitatives. Le versant qualitatif portera sur une analyse de contenus du récit des six derniers mois afin de déterminer la présence de chute et de caractériser cette dernière (intégré vs non-intégré). Le versant quantitatif cherchera à évaluer le vécu subjectif du durant la chute par plusieurs questions fermées et une évaluation des émotions associées (ex : SAM - Self Assessment Manikin, REFFF ?).

Nous soutenons l'idée que les chutes non-intégrées à l'histoire de vie entraine une reviviscence plus fréquente et plus nombreuse, avec une coloration émotionnelle intense concomitante à un nombre et une fréquence de chute plus grande. Ainsi, nous portons l'idée que la non intégration des chutes à la mémoire autobiographique est un facteur de risque pour de future rechute.

9. CONCLUSION

La chute, bien qu'elle soit souvent perçue comme un événement physique ponctuel, a des implications profondes sur la mémoire autobiographique et l'identité personnelle des personnes âgées. Ce travail met en lumière l'importance de considérer la chute non pas comme un simple accident, mais comme un événement spécifique marquant, capable d'influer sur son récit de vie, perturber son identité personnelle et ainsi d'influencer son bien-être psychologique. À travers le prisme du modèle MEMFA, nous avons démontré que l'intégration des souvenirs de chute dans la mémoire autobiographique joue un rôle central dans la perception de soi, la continuité de l'identité et la gestion psychologique de cet événement.

Les résultats soulignent que les souvenirs de chute non intégrés perturbent la cohérence du soi et sont fortement associés à des manifestations accrues d'anxiété, de dépression et de peur de la rechute. Ces souvenirs non résolus deviennent alors des points de rupture dans le récit de vie, freinant le processus de résilience et contribuant à un cercle vicieux où la peur de la rechute augmente le risque de nouvelles chutes. À l'inverse, les souvenirs intégrés, bien qu'ils soient émotionnellement marquants, semblent favoriser une meilleure adaptation à cet événement traumatique, une résilience accrue et une capacité renforcée à se réapproprier l'expérience vécue.

Sur le plan clinique, cette analyse offre des perspectives prometteuses pour améliorer la prise en charge des personnes âgées chuteurs. Le modèle MEMFA fournit un cadre théorique permettant de comprendre pourquoi certains souvenirs de chute sont bien intégrés, tandis que d'autres restent non résolus. En s'appuyant sur ce cadre, comme évoqué dans la discussion, il est possible de développer des interventions ciblées pour aider les individus à intégrer plus efficacement ces souvenirs, à réduire leur charge émotionnelle négative et à restaurer leur continuité identitaire. Au-delà de ces applications cliniques, ce travail appelle également à un changement de paradigme dans la manière de concevoir la chute chez la personne âgée. L'approche traditionnelle, centrée sur les aspects biomédicaux, doit être élargie pour inclure une perspective psychosociale et identitaire. Comprendre la chute comme un événement intégré à la mémoire autobiographique permet non seulement de mieux appréhender son impact sur le bien-être psychologique, mais aussi de proposer des solutions adaptées aux besoins spécifiques des chuteurs.

Enfin, les résultats obtenus invitent à poursuivre la recherche sur les mécanismes d'intégration des souvenirs de chute. Des études longitudinales sont nécessaires pour explorer comment ces souvenirs évoluent au fil du temps et pour identifier les facteurs favorisant leur intégration réussie. De plus, l'évaluation des interventions cliniques basées sur le modèle

MEMFA pourrait fournir des preuves supplémentaires de son efficacité et guider le développement de nouvelles stratégies de prise en charge.

En conclusion, ce travail montre que la chute est un événement à multiples facettes, touchant à la fois le corps, la mémoire et l'identité des personnes âgées. En adoptant une approche intégrative qui englobe ces dimensions, il est possible d'améliorer significativement la qualité de vie des chuteurs, tout en préservant leur autonomie et leur bien-être psychologique. Le modèle MEMFA constitue ainsi une base solide pour repenser l'accompagnement des personnes âgées chuteurs, en offrant une perspective théorique et clinique innovante et prometteuse.

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