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HEC MONTRÉAL

Partager un écran à deux: Impact du magasinage en ligne sur l'expérience utilisateur d'un couple

par

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CERTIFICAT D'APPROBATION ÉTHIQUE

La présente atteste que le projet de recherche décrit ci-dessous a fait l'objet d'une évaluation en matière d'éthique de la recherche avec des êtres humains et qu'il satisfait aux exigences de notre politique en cette matière.

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Résumé

Le *magasinage collaboratif en ligne* est une pratique commune pour beaucoup de couples (Tchanou, Léger, Senecal, et al., 2020). Des étudiants travaillant sur un même projet, des amis planifiant un voyage ou un couple magasinant une maison ensemble sont tous des exemples de situations où le magasinage collaboratif en ligne peut être pratiqué. Une récente étude réalisée en 2018 a révélé que 53% des achats en ligne fait par les ménages sont opérés par deux personnes ou plus (al., 2018). Pourtant, malgré cette pratique répandue, peu de ressources sont disponibles sur le sujet, particulièrement dans le cas d'un couple magasinant ensemble en ligne sur un seul ordinateur, côte à côte.

Ce mémoire par articles étudie plusieurs dimensions de l'expérience d'un couple lors d'un achat en ligne sur le même ordinateur. Tout d'abord, il étudie les comportements qu'adoptent les membres d'un couple ainsi que l'effet de ces comportements sur les deux individus lorsqu'ils doivent se partager un seul ordinateur dans le contexte de magasinage en ligne. De plus, ce mémoire évalue l'effet d'avoir le contrôle de l'ordinateur sur l'état émotionnel (plaisir et état d'éveil) des participants ainsi de l'effet d'échanger le contrôle (p. ex. donner la souris/clavier à son partenaire) sur les deux partenaires.

Une étude comprenant deux tâches et trois questionnaires a été conduite avec 40 couples. Les couples, devant magasiner des forfaits d'activité ou d'hébergement en ligne, étaient filmés et enregistrés, permettant par la suite la codification des vidéos ainsi que l'analyse de l'expérience vécue (FaceReader software) des participants. Outre les données tirées des vidéos, les questionnaires administrés tout au long des tests utilisateurs ont permis d'évaluer l'expérience perçue des participants sur plusieurs dimensions, dont leur état émotionnel (plaisir et éveil) (Betella & Verschure, 2016), leur satisfaction, leur intention de refaire l'activité ainsi que leur perception de conflits.

Les résultats du premier article, étant exploratoire, suggèrent que le participant passif (non en contrôle de l'ordinateur) a tendance à pointer l'écran et donner des ordres sur la navigation à son partenaire. Les résultats suggèrent que le comportement de *pointer l'écran* (fait par la personne qui observe) n'est pas déplaisant pour la personne active (en

contrôle des périphériques). Cependant, la personne active semble beaucoup moins apprécier de se faire donner des ordres sur la navigation qu'elle devait faire. Les résultats du second article suggèrent que les utilisateurs éprouvent plus de plaisir lorsqu'ils sont en contrôle des périphériques de l'ordinateur que lorsqu'ils sont observateurs (en mode passif). Nous observons par ailleurs que de s'échanger le contrôle, tout à tour, entre les partenaires d'un couple, pourrait être bénéfique pour l'expérience.

Ce mémoire par articles a pour but de combler une partie de l'écart dans la littérature sur la collaboration des membres d'une dyade lors du magasinage en ligne côte à côte. Le premier article de ce mémoire, qui est une recherche exploratoire, conclu sur des hypothèses et des pistes pour les recherches futures. Le second article, quant à lui, contribue à avancer la recherche sur l'effet d'être en contrôle des périphériques ou non sur les personnes participant à du magasinage en ligne collaboratif.

Mots clés : Magasinage collaboratif en ligne, magasinage à deux, collaboration en ligne

Méthodes de recherche : Tests utilisateurs, observations, codification de vidéos, tests statistique

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Liste des abréviations

CIS : Collaboration information seeking

CISS : The Couple Interactive Scoring System

DPT : Dyadic power theory

UX : User experience

Avant-propos

Ce mémoire, composé de deux articles et rédigé dans le cadre de la maîtrise en expérience utilisateur, a été soumis avec l'autorisation de la direction administrative du programme de la Maitrise ès Science en Gestion. Tous les coauteurs des articles ont donné leur autorisation pour que les articles soient utilisés dans le cadre de ce mémoire.

L'article 1, *Co-Located Couples Shopping Online Together: An exploratory study* a été co-écrit avec Camille Grange et Pierre-Majorique Léger.

L'article 2, *Sharing a Screen While Shopping Online: The Effects of Device Control and Taking Turns on a Couple's User Experience* a été co-écrit avec Sylvain Sénécal, Camille Grange et Pierre-Majorique Léger. Cet article a été soumis à la conférence ICIS 2021. Le 31 juillet 2021, les auteurs ont reçu la décision du refus de l'article pour la conférence. Tout de même, les commentaires du jury ont été pris en considération et ont été intégrés à l'article. À la suite de la réception des commentaires du jury, la revue de littérature a été ajustée afin d'inclure des sources supplémentaires sur la collaboration en ligne et a aussi été enrichie afin d'appuyer l'importance de la recherche sur le magasinage en ligne collaboratif. Finalement, la section sur les contributions de l'article et de la recherche a été davantage élaborée afin d'expliquer plus amplement les pistes de solutions proposées.

Le comité d'éthique en recherche (CER) de HEC Montréal a approuvé la collecte des données pour cette recherche (2021-3893).

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Je tiens commencer mes remerciements en remerciant ma directrice et mon directeur de mémoire, Camille Grange et Pierre-Majorique Léger, qui m'ont soutenu et accompagné tout au long de ce parcours. Je tiens aussi à remercier Sylvain Sénécal pour sa précieuse aide tout au long de l'écriture de ce mémoire. Merci à vous trois de m'avoir fait confiance avec ce projet et m'avoir donné l'opportunité de travailler avec vous. Grâce à vous, j'entame ma carrière avec confiance.

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Chapitre 1
Introduction

1. Mise en contexte

Lors d'une récente étude investiguant les habitudes de magasinage en ligne des couples, 43,95% des couples répondants ont dit passer plus de 3 heures ensemble par semaine à faire du magasinage collaboratif en ligne (Tchanou, Léger, Senecal, et al., 2020). De plus, cette même étude révèle que la grande majorité des couples utilisent deux téléphones (93,59%), un seul ordinateur (92,05%) ou deux ordinateurs différents (86,67%) pour magasiner en ligne ensemble.

1.1 La collaboration en ligne

La collaboration de plusieurs personnes sur un seul ordinateur est une pratique populaire depuis des décennies (Morris, 2008; Shah, 2014), et ce, dans plusieurs contextes. Le terme *co-located browsing*, que l'on peut traduire de l'anglais par la *navigation côte à côte* est une pratique qui consiste à surfer le Web avec une ou plusieurs autres personnes sur le même ordinateur (Shah, 2014). À travers les années, plusieurs termes se sont ajoutés au lexique de la collaboration en ligne, ceux-ci définissant différentes variations de la pratique. Par exemple, *collaborative information seeking* (CIS) ou en français, *recherche collaborative d'informations,* est un terme utilisé chez les chercheurs en collaboration en ligne. On peut qualifier une activité de *recherche collaborative d'informations* (CIS) lorsque le but de deux collaborateurs ou plus est de trouver des informations ou de se renseigner sur quelconques sujets (Shah, 2014; Tao & Tombros, 2017). Le CIS ne définit pas si les collaborateurs se trouvent dans la même pièce, sur le même ordinateur, ou s'ils se trouvent à des milliers de kilomètres les uns des autres. D'autres termes comme le *co-browsing* ou le *collaborative information retrieval* sont aussi utilisés dans la littérature (Shah, 2014).

Plusieurs chercheurs et auteurs se sont donc penchés sur les différentes dimensions que peuvent prendre la *collaboration en ligne.* Par exemple, une enquête, réalisée il y a plus

d'une décennie auprès de 204 employés de chez Microsoft, a dévoilé que 87,5% des participants avaient déjà regardé « par-dessus l'épaule » de quelqu'un lors d'une navigation en ligne avec une autre personne (Amershi & Morris, 2008). Dû aux différentes formes que peut prendre la collaboration en ligne ainsi que les différents endroits où les collaborateurs peuvent se trouver, de nombreux systèmes ont vu le jour pour faciliter tous ces différents types de collaborations. Par exemple, Amershi et Morris (2008) ont développé un système appelé *CoSearch* afin d'améliorer l'expérience de recherche collaborative sur le Web, en permettant l'utilisation de souris supplémentaires ou du téléphone cellulaire (Amershi & Morris, 2008; Shah & González-Ibáñez, 2012).

1.2 Magasinage collaboratif en ligne

Le magasinage est une activité qui tend naturellement aux interactions sociales (Tao & Tombros, 2017; Wei et al., 2017). En effet, il est reconnu que de magasiner avec ses proches peut augmenter le plaisir que l'on en tire, en plus de faire dépenser davantage d'argent (Topaloglu, 2013; Wei et al., 2017). L'expérience de magasinage, qu'elle soit en ligne ou en magasin, peut être grandement influencée par l'opinion d'amis, de la famille et même d'autres consommateurs (Kim et al., 2013). Les résultats d'une recherche sur les facteurs influençant la décision des couples de magasiner ensemble démontrent que le plaisir attendu de l'expérience est l'un des plus grands influenceurs à la décision de magasiner avec son/sa conjoint(e) (Lim & Beatty, 2011).

Pratique de plus en plus populaire, le magasinage collaboratif en ligne est une pratique du e-commerce qui permet à des acheteurs de connecter et d'échanger, même à distance (Yue et al., 2014). Les utilisateurs de sites de magasinage en ligne seraient d'ailleurs même significativement plus engagés lorsqu'ils perçoivent la présence d'un autre acheteur en ligne en même temps (Wei et al., 2017). Plusieurs études ont investigué le magasinage collaboratif (*co-shopping* ou *collaborative shopping*) (p. ex. Y. Gao et al., 2016; Goswami & Hai Teo, 2007; Kim et al., 2013; Topaloglu, 2013; Yue et al., 2014; Zhu et al., 2010), mais toujours en prenant en considération que les collaborateurs y participant sont à distance et non l'un à côté de l'autre. De plus, la plupart de ces études se concentrent particulièrement sur les différents outils disponibles ou les différentes configurations (p.

ex. *split screen*, *shared view*, etc.) des pages Web (Topaloglu, 2013; Yue et al., 2014) offertes aux personnes voulant magasiner collaborativement à distance. Cependant, lorsque l'on se penche plus particulièrement sur l'achat en ligne concernant deux personnes assises côte à côte, peu de ressources sont disponibles afin de démystifier comment des groupes de deux personnes ou plus magasinent en ligne ensemble sur un seul ordinateur. En ce qui concerne le fait de magasiner en ligne avec son/sa conjointe, les ressources sont pratiquement nulles.

1.3 Comportements des utilisateurs lors de la navigation collaborative

Lorsque des collaborateurs décident de partager un écran, c'est à eux de décider comment procéder et de choisir qui prendra le contrôle de l'ordinateur (Shah & González-Ibáñez, 2012). À la fin des années 90, une étude a été réalisée (Stewart et al., 1998) avec des enfants d'école primaire utilisant un seul écran dans un contexte d'apprentissage. Leurs observations démontrent que les étudiants avaient tendance à se chamailler pour le contrôle de l'ordinateur, que la personne qui n'était pas en contrôle pointait souvent l'écran et donnait des ordres à l'étudiant en contrôle. De plus, l'étudiant qui n'avait pas de contrôle sur l'ordinateur avait tendance à moins porter attention à l'activité en plus de ressentir davantage de frustration que la personne active. Le problème de contrôle des périphériques semble donc être un sujet important afin de mieux comprendre comment les sites de e-commerce peuvent y réagir. Il est pertinent de comprendre l'impact que peut avoir un déséquilibre dans le contrôle des périphériques sur l'expérience des couples. En effet, lors d'une prise de décision dans un couple, particulièrement lorsqu'il y a un déséquilibre du pouvoir entre les individus, des conflits sont voués à se produire (Coleman et al., 2014).

1.4 La théorie du flow

Finalement, la théorie du flow a guidé la recherche ainsi que le choix des variables dépendantes à mesurer durant l'étude. En effet, la théorie du flow constitue une expérience optimale et agréable durant laquelle les individus se sentent en contrôle de leurs actions (Csikszentmihalyi, 1990). Être dans un *état de flow* est une expérience émotionnelle. Les émotions, quant à elles, peuvent être catégorisées en deux dimensions, soit la valence

émotionnelle (plaisir éprouvé lors de l'activité) et l'état d'éveil (le niveau d'intensité ressenti durant l'expérience) (Posner et al., 2005). Le concept d'état de flow est très largement relié au concept de l'absorption cognitive (en anglais : *cognitive absorption)* (Agarwal & Karahanna, 2000). Cinq dimensions font parties de l'absorption cognitive, dont trois étant particulièrement importantes pour la recherche décrite dans ce mémoire : 1) l'aspect de contrôle, ou le sentiment d'être en contrôle de l'interaction, 2) le plaisir ressenti durant l'interaction, et 3) l'excitation (ou état d'éveil) des sens de l'utilisateur.

En résumé, l'état de flow permet de mieux comprendre les sentiments que peuvent percevoir les individus lors d'une interaction avec un ordinateur. Nous avons pu lier certaines découvertes et résultats décrits dans les articles à la théorie du flow.

2. Objectifs et questions de recherche

L'importance grandissante des commerces en ligne de se différencier de ses compétiteurs ainsi que l'écart surprenant dans la littérature concernant le l'achat en ligne collaboratif, surtout chez un couple, sont les deux motifs ayant motivé la recherche pour ce mémoire. L'objectif de ce mémoire est de mieux comprendre comment les couples magasinent en ligne ensemble lorsqu'ils sont assis côte à côte. Plus particulièrement, l'objectif était de générer des idées et pistes de solutions afin de soutenir la collaboration en ligne, notamment dans le contexte d'un couple magasinant de leur domicile. Nous croyons qu'il est pertinent et important pour les commerces en ligne de comprendre comment les consommateurs interagissent avec leurs produits et comment ces produits peuvent être améliorés afin de fournir la meilleure expérience utilisateur possible. Finalement, cette recherche a aussi pour but de démontrer l'importance de la collaboration en ligne à l'air numérique.

Dans un premier temps, le premier article aborde plus largement les comportements observés lors de tests utilisateurs sur 40 couples. Cet article répond aux deux questions de recherche suivantes :

1) Quels comportements le partenaire en contrôle des périphériques de l'ordinateur (personne active) et le partenaire non en contrôle des périphériques (partenaire passif) adoptent-ils pendant l'achat en ligne collaboratif ?

2) Quels sont les effets de ces comportements sur l'expérience utilisateur des deux partenaires ?

Dans le second article, nous nous questionnons davantage sur l'effet d'être en contrôle ou non des périphériques de l'ordinateur sur l'expérience des couples. Les questions de recherches auxquelles le second article répond sont les suivantes :

1) Comment le fait d'avoir le contrôle des périphériques de navigation influence-t-il l'expérience d'achat en ligne des couples?

2) Quel est l'effet d'alterner le contrôle des périphériques de l'ordinateur entre les partenaires sur l'expérience du couple?

3) Comment les conflits qui peuvent émerger dans une situation d'asymétrie de contrôle affectent-ils l'intention des partenaires de continuer à faire du magasinage en ligne ensemble?

3. Information sur les articles

Les deux articles adressent le même sujet, soit celui du magasinage collaboratif en ligne (côte à côte), mais ont été rédigé dans deux formats différents. Les deux articles ont été écrits dans l'optique d'être ensuite mis en commun pour ce mémoire.

Utilisant la même collecte de données, soit les tests utilisateurs fait avec 40 couples, le premier article est une recherche exploratoire, sans formulation d'hypothèses au début de la recherche. Dans ce premier article exploratoire, nous abordons les types de comportements qui émergent chez les personnes magasinant en ligne côte à côte. Pour cet article, les résultats proviennent de la codification des vidéos des participants ainsi sur des données venant des questionnaires. Le deuxième article, quant à lui, est construit sur six

hypothèses auxquelles nous tentons de répondre avec l'analyse des résultats venant des réponses aux questionnaires.

Les résultats présentés dans les deux articles proviennent des mêmes tests utilisateurs, exécutés de juin 2020 à août 2020. Dans le contexte de la pandémie et les couples ne pouvant se déplacer au laboratoire du Tech3Lab, nous avons choisi d'utiliser le logiciel LookBack (Lookback Group Inc., Palo Alto, CA) afin de pouvoir poursuivre la recherche. Le logiciel Lookback nous a permis de faire le test utilisateur avec 40 couples, nous permettant de voir leur écran, leur visage ainsi que d'entendre leur voix. Les vidéos ont été enregistrées avec la permission des répondants. Les participants devaient accomplir deux tâches de magasinage en ligne, ayant chacun le contrôle des périphériques de l'ordinateur (souris, clavier, trackpad et écran tactile) durant l'une des deux tâches. Chaque participant a aussi individuellement rempli un questionnaire avant le début de l'expérience, un second après la première tâche ainsi qu'un troisième et dernier questionnaire après la deuxième tâche. Les questionnaires étaient construits afin que les participants puissent évaluer leur propre état émotionnel (Betella & Verschure, 2016), c'est-à-dire leur niveau de plaisir et d'éveil après chaque tâche. Ils évaluaient aussi leur niveau de satisfaction, leur intention de recommencer l'activité ainsi que leur perception des conflits durant les tâches.

3.1 Résumé de l'article 1

L'article 1 avait comme objectif de voir le type de comportements qui ressortiraient chez les participants lors du magasinage en ligne avec leur partenaire sur un seul ordinateur. De plus, nous voulions comprendre l'effet de ces comportements sur les participants et sur leur état émotionnel. Pour ce faire, nous avons codifié les vidéos de 36 couples (la qualité de 4 vidéos ne nous permettant pas de les codifier) grâce à une grille de codes établis préalablement. La codification s'est faite grâce au logiciel Observer XT de Noldus (Noldus Information Technology Inc. Wageningen, Netherlands) qui permet l'importation de vidéos, la codification de ceux-ci et l'exportation des résultats pour analyse. La grille de codes, basée sur les travaux de deux différents chercheurs (Brinberg & Schwenk, 1985; Hall et al., 2005) a été bonifiée pour mieux nous outiller à coder les

vidéos. Plus précisément, certains codes ont été créés par les auteurs de cet article afin de codifier des comportements qui n'apparaissaient pas dans les recherches précédentes. Grâce aux enregistrements des tests utilisateurs, nous avons pu faire l'analyse des expressions faciales de chaque participant individuellement, utilisant le logiciel FaceReader software (Noldus, Wageningen, Netherlands). Finalement, nous avons aussi utilisé les données provenant des questionnaires administrés à chaque répondant individuellement.

Par la suite, la codification des vidéos a été triangulée avec l'analyse des expressions faciales (FaceReader Software, Noldus, Wageningen, Netherlands) ainsi que les résultats des réponses aux questionnaires administrés tout au long des tests utilisateurs. Nous avons pu obtenir les fréquences des comportements en moyenne par tâche, répondant à notre première question de recherche. Les résultats démontrent plus de comportements « dominants » de la part de la personne passive (la personne n'étant pas en contrôle de l'ordinateur) que de la personne active (en contrôle de l'ordinateur). La personne passive s'est trouvée à souvent pointer l'écran ainsi que de dire quoi faire à son/sa partenaire.

En ce qui concerne la seconde question de recherche, nous avons utilisé des tests de régressions logistiques multiples afin de pouvoir voir l'effet des catégories de comportements ainsi que des comportements individuels sur l'état émotionnel, la satisfaction, l'intention de continuer, la perception des conflits et la valence des participants. Cette analyse a démontré que certains comportements, notamment les comportements que nous qualifions de *dominants* sont nuisibles à la collaboration, particulièrement pour le participant en contrôle de l'ordinateur. Finalement, l'article se conclut sur des hypothèses et des idées pour de futures recherches.

3.2 Résumé de l'article 2

Le second article aborde aussi le sujet des couples magasinant ensemble sur un seul ordinateur. Pour cet article, seulement les données des questionnaires ont été utilisées. Plus particulièrement, nous avons regardé l'effet d'être en contrôle (avoir le contrôle de l'ordinateur / ses périphériques) sur l'état émotionnel des participants (plaisir et état d'éveil) ainsi que sur leur intention de refaire l'expérience avec leur partenaire. L'état

émotionnel des participants, leur intention de continuer ainsi que leur perception des conflits ont été évalué par les répondants eux-mêmes. Nos résultats démontrent que les répondants en contrôle de l'ordinateur avaient plus de plaisir, était plus excités (plus éveillés) et ont noté leur intention de refaire l'expérience plus haut que leur partenaire en situation « passive ».

Nous avons posé comme troisième et quatrième hypothèses que l'écart dans l'état émotionnel et l'intention de continuer entre les deux partenaires du couple, diminue lorsqu'ils s'échangent le contrôle de l'ordinateur. Nos hypothèses sont supportées par nos résultats, démontrant que le plaisir et l'état d'éveil de la personne initialement active (en contrôle) ne diminuent pas significativement lorsqu'il ou elle donne le contrôle à son/sa partenaire pour la deuxième tâche. Nous considérons donc que cet échange de contrôle n'est pas considéré comme déplaisant pour la personne initialement active, qui devient passive. De plus, ces résultats démontrent que l'échange de contrôle pour la personne initialement passive (qui n'est pas en contrôle) et qui devient en contrôle, a un effet positif sur son état émotionnel et sur son intention de refaire l'activité. En bref, les deux partenaires peuvent ressortir gagnants de cet échange. Nous utilisons la théorie de l'échange social (*social exchange theory*) pour expliquer ce phénomène.

Finalement, nous avons posé deux dernières hypothèses : *la perception des conflits de types affectifs va avoir un effet négatif sur l'état émotionnel des répondants ainsi que sur leur intention de continuer.* Les conflits sont une part importante de la vie des couples et peuvent émerger lorsque qu'il y a une décision à prendre (Su et al., 2008), comme dans le contexte de notre expérience. Nous avons trouvé qu'un participant ayant eu une plus grande perception de conflits affectifs durant les tâches n'influençaient pas négativement son état émotionnel, mais influençait négativement son intention de refaire le magasinage collaboratif en couple.

4. Contribution et responsabilités individuelles

Les articles écrits dans le cadre de ce mémoire ont été réalisés en collaboration avec le Tech3lab de HEC Montréal. Ma contribution à chacune des étapes de la recherche,

d'analyse ainsi que de l'écriture des articles est décrite dans le tableau présenté ci-dessous. Ma contribution personnelle est inscrite en pourcentage.

Table 1. Contributions et responsabilités personnelles

Étape du processus	**Contribution**
Revue de la littérature	Rédaction de la revue de littérature – 100%
Définition de la question de recherche	Définition de la question de recherche - 30% • Mes codirecteurs de mémoire ont contribué à la définition de la question de recherche principale.
Conception du design expérimental	Compléter de la demande au CER ainsi que les formulaires de modification de projet – 90% • Un membre de l'équipe d'opération du Tech3Lab s'est assuré que la demande était complète et bien remplie. • Suite à l'annonce de la fermeture du laboratoire (pandémie), un membre du Tech3lab m'a aidé avec les modifications à faire au design expérimental afin de suivre les mesures sanitaires en vigueur à ce moment. Conception des protocoles des expériences : 90% • Les membres de l'équipe d'opération du Tech3Lab ont fourni un protocole de base sur le Logiciel Lookback, utilisé pour la collecte de données et à envoyer aux participants.

	• Le protocole fourni par le Tech3Lab pour le Logiciel Lookback a été intégré au protocole des tests utilisateurs construit par moi-même (avec commentaires des co-directeurs du mémoire). Création des trois questionnaires a administré avant et pendant l'expérience – 80% • Les questionnaires ont été construits sur le modèle d'une recherche présentement en exécution par un étudiant au doctorat.
Recrutement des participants	Recrutement des participants – 100% • Je me suis chargée du recrutement ainsi que du suivi de tous les participants.
Prétest et collecte de données	Envoie des questionnaire pré test utilisateur – 100% Prétest – 80% • Un membre de l'équipe du Tech3Lab s'est assuré que le protocole ainsi que le test utilisateur étaient prêts à être fait avec de *vrais* participants. Collecte des données – 70% • Une stagiaire d'été du Tech3Lab et moi-même avons modéré les test utilisateurs à distance et collecté toutes les données. Suivi avec les participants pour la remise des compensations – 100%
Codification des vidéos	Codification des vidéos – 75%

	• Une stagiaire d'été du Tech3Lab a analysé et codifié certaines vidéos
Extraction et transformation des données	Extraction des données des questionnaires – 100% • Un membre de l'équipe statistique du Tech3Lab s'est chargé de la transformation des données avec SAS Extraction des données FaceReader – 20% • Un membre du Tech3Lab s'est chargé d'importer et exporter les données dans le logiciel.
Analyse des données	Préparer l'analyse des données FaceReader et les données du questionnaire – 100% Réaliser les analyses statistiques – 80% • Un statisticien du Tech3Lab m'a conseillé dans les analyses statistiques plus complexes.
Rédaction des articles	Rédaction des articles – 100% • Les articles ont été révisés et bonifiés à la suite des commentaires des coauteurs tout au long de la rédaction. Écriture du mémoire – 100%

Chapitre 2
Co-Located Couples Shopping Online Together: An Exploratory Study

Abstract

Couple's might often find themselves in situations where they need to shop together for a good or service needed by both partners. In fact, a study revealed that 93.59% of couples appear to be jointly shopping together at least occasionally on the same computer (Tchanou, Léger, Senecal, et al., 2020). In this paper, we look at the behaviors in which couples engage in while collaboratively shopping together on the same computer. We also investigate the impact of those behaviors on both partner's emotional state (pleasure and arousal), their intention to do the activity again, their satisfaction, and their perception of conflict during the task. User tests with 40 couples revealed that the partner who is not in control of the computer tends to point the screen and tell their other half what to do. While the first behavior, pointing the screen, is not something that bothered any of the two partners, *being told what to do* has negatively affected both the intention to do the experience again and the satisfaction of the active partner. We conclude with hypothesis and future research that could be built on our findings.

1. Introduction

A study revealed that 53% of online purchases by households are made by two or more people shopping online together (al., 2018). Moreover, each year, the number of digital buyers keep climbing (Coppola, 2021). In 2020 only, e-retail sales exceeded 4.2 trillion U.S. dollars worldwide, while in 2019, these sales rose to 3.3 trillion of US dollars. This important increase of the global retail e-commerce sales, which grew with more than 25% (Coppola, 2021), shows how important it is to understand how internet users shop online and how they interact with their computers or mobiles to do so.

Although computers tend to be designed for use by single individuals, co-located collaborative shopping has been a prevalent practice for some time (Amershi & Morris,

2008; Zhu et al., 2010). Couples might find themselves in a situation in which they need to shop for a good or service to be 'consumed' together, such as airplane tickets, new furniture or even for the food they want to order online (Amershi & Morris, 2008; Tchanou, Léger, Senecal, et al., 2020).

While co-located collaborative browsing has been explored over the years (Fleck et al., 2021; Q. Gao et al., 2016; Stewart et al., 1999), its derivative, *co-located collaborative shopping* has been mostly left aside in the literature (Tchanou, Léger, Senecal, et al., 2020). Researchers have studied collaborative online shopping but mostly in a context where partners were not in the same room (e.g. Goswami & Hai Teo, 2007; Kim et al., 2013; Topaloglu, 2013; Wei et al., 2017; Yue et al., 2014; Zhu et al., 2010). However, the research on how couples or dyads shop together side-by-side is scarce. Using a single computer while collaborating poses issues such that often only one of the collaborators has control over the browsing device (e.g. the mouse and keyboard), while the other person looks over their partner's shoulder and comments on their partner's navigation (Amershi & Morris, 2008; Stewart et al., 1998). In this case, being in control (e.g. being the active person) versus not being in control (e.g. the passive partner) might have an impact on each partner's user experience.

As little research has been done on how partners, specifically couples, shop online together co-locatively, we set out to explore how couples share a computer (its screen, mouse, and keyboard) and how both partners interact together and with the technology. We focused our exploratory research on two key research questions: 1) *Which behaviors do the controlling partner (active) and the non controlling partner (passive) engage in during the collaborative online shopping?* 2) *What are the effects of these behaviors on both partners' user experiences?*

To answer our research questions, our experiment was theory-*directed* (Franklin, 2005) to gain new insight on co-located collaborative online shopping, precisely when couples are sharing a screen (Jaeger & Halliday, 1998). To guide our research and to focus on the couple's user experience, we chose two different theories which helped direct our exploratory research and to guide us for future research (Franklin, 2005). First, *flow theory*

informed us on how control and user experience are intrinsically linked. Second, *dyadic power theory* helped frame behaviors that are bound to happen between partners when there is an imbalance in power (e.g. when one partner is in control of the computer and the other is observing).

To understand how couples co-locatively shop online together, we conducted an experimental study with 40 couples engaging in co-located collaborative online shopping. Each couple had to complete two consecutive tasks, which consisted of shopping online together. Each partner had the control over the computer's peripherals for either the first task or the second one. Our focus was on how partners interacted with each other and with the computer while shopping together. Each participant individually completed one questionnaire before the experiment and two between the tasks. As the couples were recorded while shopping online, researchers were able to code the videos to then conduct statistic tests linking the behaviors to certain measures like their pleasure, arousal, satisfaction, intention to do collaborative shopping again and their perceived conflict.

In this exploratory research paper, we provide background literature which guided our research and experiment, describe our methodology and results and discuss our findings as well as the hypotheses which arose from these findings.

2. Background literature

2.1 Co-located collaboration

Different terms have been used over the last few decades to describe different types of online collaboration (Shah, 2014). The phenomenon of two people or more browsing the web together, either remotely or co-located, has been defined as *collaborative browsing* (Y. Gao et al., 2016) which includes browsing the web together on the same computer as well as browsing from two different computers. Another term, *collaborative information seeking* (CIS), is also commonly used to describe the same phenomenon, in which participants are seeking the same information to solve an issue (Tao & Tombros, 2017). For this research, we use the term *co-located collaborative shopping*, which best describes

the experiment that was conducted for this paper. Indeed, we define *co-located collaborative shopping* as a form of online shopping performed by two people or more, on the same device (Yue et al., 2014).

Researchers have found there can be multiple issues when a team is trying to collaborate. Examples include the possibility that some members are not able to contribute to the same extent as their partner(s) to the task because of their lack of user control (Amershi & Morris, 2008). Other issues could also be pacing problems, which means that the observer does not have enough time to read the screen or is sitting too far away. Partners can also experience information loss, meaning that the team can have difficulty keeping track of their findings (Amershi & Morris, 2008). Similarly, another research which focused on children sharing a single computer found that the passive user (the child not in control) lacked attention and often looked away from the screen (Stewart et al., 1998). This research also showed that children would fight for the control of the input devices (mouse and keyboard) and that those who were not in control would point at the screen and issue orders to the other child.

Another research has focused on how children use tablets in a learning environment (Fleck et al., 2021). This research described how kids interacted together and with the tablet, revealing issues like the lack of attention that some kids experience while looking over their partner's shoulder and the dominance of other children who took control over the interaction, leaving almost no space for their partner to also participate. Indeed, some dyads automatically shared controls while other dyads had more trouble figuring out how to share the tablet (Fleck et al., 2021).

Over the years, different systems have been created to facilitate online collaboration either for remote or co-located use. The idea of "social browsing" was introduced three decades ago, and a system called CRUISER was created (Root, 1988) to support collaborative work through an interface. Other researchers have followed the trend and created an array of different systems that would work to support all types of collaborations (e.g. collaborators looking at databases or partners browsing the web together). For example, another system, *CoSearch* (Amershi & Morris, 2008) enabled co-located collaborators to

navigate the Web together and only required extra devices like mobile phones or a second mouse, which are often already available to people.

2.2 Collaborative shopping

Collaborative shopping is a form of collaborative browsing that involves individuals seeking to purchase something together (Goswami & Hai Teo, 2007). This too, can be executed remotely or co-locatively. A recent study found that couples spend a significant amount of time navigating the internet together, with 44.62% of couples spending 3 hours per week, 28.21% spending more than 6 hours during a week, and 11.79% spending more than 10 hours per week jointly shopping together (Tchanou, Léger, Senecal, et al., 2020). The same research also showed that 92.05% of couples reported using the same computer to jointly shop online and 93.59% reported using two separate smartphones.

Moreover, some situations particularly require close collaboration between friends, family and colleagues to solve consensual decisions (e.g. shopping for a house or for travel) (Shah, 2014). However, current computer systems are only equipped with one explicit input device (mouse/keyboard) so that when multiple users try to collaborate using a single computer, it is up to them to work out how to proceed and share control (Stewart et al., 1998). Multiple studies have researched the role of having control in different contexts, such has in video games or in interactive movies (Oh et al., 2014; Schrader & Nett, 2018). Nevertheless, there is still a gap in the literature when we search for studies looking into the role of device control (having control and foregoing it) in the context of co-located online shopping, which is central to the success of the collaboration. Thus, the subject of collaborative online shopping seems like an important one.

Collaboration is a particularly essential aspect of couples' life, especially while making purchase decisions. Instead of making a single decision, most couples reach a decision through a sequence of multiple unstructured smaller decisions, which eventually lead to a major purchase (Simpson et al., 2012). In a study on the process of influence in couples, (Corfman & Lehmann, 1987) found that many couples follow a "turn-taking" rule, that is, partners take into consideration who made the last purchase choice, allowing the other

one to choose this time around (Simpson et al., 2012). Zhu et al. (2012) suggest that the primary motive for shopping is to enjoy leisure time with family and friends, and that while collaborative online shopping is used to fill a mutual need (e.g., having to buy a new house), partners also expect some pleasure to be coming out of the experience (Lim & Beatty, 2011).

Overall, the existing literature indicates that collaborative online shopping is a common activity and that there is still research being done on how to alleviate collaborative browsing (Goswami & Hai Teo, 2007; Shah, 2014; Tchanou, Léger, Senecal, et al., 2020). Next, we examine how device control influences a person's online shopping experience.

2.3 The Impact of Device control on Couple's Online Shopping Experience

Today's technology enables users to control what they want to see on their screen with simple input devices like the mouse or the keyboard (Wise & Reeves, 2007). This control is what allows users to interact with the machine. Having active control, as a dimension of interactivity, is thought to lead to greater cognitive involvement and satisfaction (Liu & Shrum, 2002). In this paper, we define "being in control" as the users' ability to manipulate a computer's browsing device to decide on the content of a web page and on the pace of presentation of the content.

The flow theory, which is presented next, provides a useful framework for investigating the effects of device control on the online shopping experience of collaborative shoppers.

2.3.1 Flow theory

The theory proposes that the state of flow is an optimal and pleasurable experience, in which individuals perceive a sense of control over their actions and have feelings of exhilaration (Csikszentmihalyi, 1990; Hsu et al., 2012). Flow can happen when people engage in any activity like browsing a website, playing video games, reading, playing sports or working, to name a few (Hsu et al., 2012).

Being in a state of flow is an emotional experience. To better understand the effect of *being in a state of flow* on the user's experience, we must look into the user's different

emotional dimensions, which are not directly explained by the flow theory. Thus, we know that emotions can be conceptualized in terms of two dimensions: 1) valence, the extent of pleasure experienced, and 2) arousal, the level of intensity felt during an experience (Posner et al., 2005). In flow theory, valence corresponds to the concept of enjoyment, and arousal maps to the sense of exhilaration. Note that the concept of flow is closely related to the concept of cognitive absorption, which represents "a state of deep involvement with software" (Agarwal & Karahanna, 2000, p.673). Cognitive absorption is manifested in five dimensions, three of which also point to the correlation between control, pleasure, and arousal: 1) control refers to the user's perception of being in charge of the interaction, 2) pleasure describes the extent of enjoyment during the interaction, and 3) curiosity refers to the arousal of the users' sensory and cognitive curiosity.

A second assumption of flow theory is that experiencing flow drives individuals to experience it again, thus to engage more in the future with the artifact (e.g., the computer, the website, the app) which is the facilitator of the experience (L. Gao & Bai, 2014). In fact, several studies have observed that customers who experience flow while shopping online are more prone to return to the website. When customers find the experience pleasurable, they want to experience it again (Bridges & Florsheim, 2008; L. Gao & Bai, 2014; Hsu et al., 2012). Gao et al. (2014) suggests that flow determines users' continuance intention of mobile social networking services. Hsu et al.'s (2012) research on online shoppers shows that being in a state of flow is significantly and positively related to continuance intention. Continuance intention, defined as the users' intention to use information systems in the future (Bhattacherjee, 2001), is critical for the success of eCommerce websites. In this paper, continuance intention is extended to the user's intention to shop online co-locatively with their partner on a single computer.

In this research, we use the state of flow to understand how having control of the peripherals of the computer can influence the participants' behaviors. We also measure the different dimensions which are linked to being in a state of flow (pleasure, arousal, continuance intention, satisfaction). Finally, to further understand a couple's collaborative online shopping experience, it was important to investigate the theories which frame a couple's decision making.

2.4 Couple's dynamics

Research has shown that conflict may arise in couples having to make decisions (Su et al., 2008). To better understand how couples shop online together and proceed to make decisions, we specifically investigated perceived conflicts during decision making using the dyadic power theory.

2.4.1 Dyadic Power Theory

The dyadic power theory (DPT), which was first proposed by Rollins and Bahr in 1976, tackles the dynamics of power, particularly in romantic relationships. The dyadic power theory states that people's perception of their own power over their partner's is increased by their perception of authority to make decisions and their access to different resources (Rollins & Bahr, 1976). In turn, perception of power increases the likelihood of the partner using *control attempts* to dominate the interaction. Control attempts are defined as an action made with the intention of gaining control (Dunbar et al., 2008; Dunbar & Burgoon, 2005).

Whilst Rollins and Bahr (1976) first suggested that the relationship between dominance and power is linear (more powerful people exert more dominance) (Rollins & Bahr, 1976), other authors argued that the relationship between perceived power and dominance is curvilinear (Dunbar et al., 2008; Dunbar & Burgoon, 2005). The authors explain that partners who will exert more dominance (more control attempts) will be those who perceive their relative power as smaller or moderate compared to their partner's. Their research concludes that extremely powerful partners do not need to make a large number of control attempts to be *in control* (Dunbar et al., 2008).

Dominance, as defined in the dyadic power theory, is rooted in context and is a communication strategy in which one partner's control attempts are accepted by the other partner (Dunbar et al., 2008). Verbal and nonverbal indicators of dominance have been researched by many authors who have identified multiple potential behaviors that could

be defined as dominant (control attempts). Some examples of verbal control attempts are talking about the issues, which is considered a positive strategy or verbal coercion, considered a negative strategy (Dunbar & Burgoon, 2005). Non-verbal dominant behaviors, or control attempts could be increases eye gaze or using more gestures, for example. Overall, the typical nonverbal dominant partner would gesture and speak more, generally being more dynamic (Dunbar & Burgoon, 2005).

Thus, we use the dyadic power theory to guide our research on how partners might interact together while shopping online, having only the usual peripherals of a computer (one mouse/trackpad, one keyboard). This theory is useful to frame the power discrepancy caused by having only one person able to control the computer at a time.

2.4.2 Conflicts

Conflicts are an important dimension of the dyadic power theory, in fact researchers have investigated how the perception of power influences interpersonal dominance and in turn, how it influences the outcomes of conflict in a romantic relationship (Dunbar et al., 2008). Conflicts have proven to arise particularly when there is a difference in power between group members (Coleman et al., 2014). Indeed, collaboration can be time-consuming and power inequalities amongst a group's members can impede progress (Shah, 2014). In these circumstances, cooperating and working together can be frustrating and inefficient, especially when collaborators disagree (Amershi & Morris, 2008). Hence, it is no surprise that collaboration, including collaborative shopping, can generate conflicts. Conflict is defined by Hurt and Welbourne (2018) "*as any social situation or process in which two or more entities are linked by at least one form of opposing psychological relation or one form of opposing interaction"* (p.227).

Two types of conflicts are often distinguished in the literature: cognitive conflicts and affective conflicts (Amason, 1996). Cognitive conflicts are task-related and occur when group members have opposing ideas and opinions. Thus, they are often perceived to be positive and to lead to greater decision-making quality. In contrast, affective conflicts tend to induce negative emotions like boredom, annoyance, anger, and frustration (Ma et al.,

2017). Conflict appears to be an impediment to decision-making but is also important for high-quality decisions (Ma et al., 2017).

2.5 Development of the research questions

In this research, we use the word *behaviors* to describe an action done by either partner and that is observable and measurable. Using the background literature and the research that has been done on dyads or groups collaboratively browsing the Web, we asked the two following questions to deepen our understanding of how couples shop online together:

Research question 1: *Which behaviors do the controlling partner (active) and the non-controlling partner (passive) engage in during the collaborative and co-located online shopping?*

Research question 2*: What are the consequences of those behaviors on both partners' user experiences?*

3. Research Method

Given the focus of our research questions and the lack of knowledge to build hypotheses, we chose an exploratory approach which allowed us to research the phenomenon of couples shopping together online, on a single computer. For the behavioral part of this research, we also chose an iterative approach that allowed us to explore our data without being stuck in a framework that fitted our subject more or less (Corbin, 2017).

3.1 Experimental design and sample

A within-subject experiment with one factor was conducted to test our hypothesis. Indeed, we tested each participant in two conditions, whether they were in control of the peripherals or not. This experiment was approved by the ethics committee of our institution (certificate number: 2021-3893).

To collect data on co-located collaborative shopping, we recruited 40 couples who would have to participate in a 1-hour long experiment. Participants had to be able to see the computer screen without glasses since the FaceReader software v.8 (Noldus Information Technology Inc. Wageningen, The Netherlands) performs better at classifying people's facial expression when there is nothing covering parts of their face and eyebrows.

90% of the couples who participated had been in a relationship for more than a year at the time of the experiment (47.5% of the couples had been together for more than 3 years and 42.5% between 1 and 3 years). The participant's average age range was between 18 to 25 years old and their average level of education was a bachelor's degree. As for the participants' gender, 42 individuals self-declared as men, 37 as women, and one as non-binary.

3.2 Procedure

Prior to the experiment, participants were asked to fill a questionnaire Qo, which included demographic, shopping habits and web browsing questions. The first questionnaire also included questions in regard to the couple's dynamics.

The day prior to the experiment, participants had to install Lookback (Lookback Group Inc., Palo Alto, CA) software on one of the partner's computers. At the time of the experiment, couples had to join the remote experience using the Lookback software, which enabled researchers to see the participants' screen and their faces. The software made it possible for the researcher to communicate instructions to the participants and to moderate the tasks. All participants were asked for their consent to record their screen, faces and voices.

The whole experiment consisted of two tasks with the same goal: couples had to navigate on a single computer and shop for an activity that they would really want to do together. We used two different websites, one for each task: CoffretPrestige.com and Outgo.ca. Half of the couples started with Coffreprestige.com and the second half started with Outgo.ca. These websites offer different types of activities, restaurants coupons, hotel

stays, etc. By participating, each couple was eligible to win the prize of their choice, with a maximum value of $200. Everyone also received a $10 Amazon gift card as a compensation for their participation in the experiment.

Before the first task, we asked participants to decide which partner would start with controlling the peripherals of the computer but we did not directly prohibit exchange of control during the task. They were then directed to start the first task on one of the two websites. When participants were done with the first task, they were asked to fill a second questionnaire, Q1, about the experience that they had just experienced.

After filling Q1, couples were instructed to switch controls so that the person who was the active participant during the first task became the passive one and vice versa. Participants then started the second task on the second website. At the end of the second task, they were asked to fill another questionnaire Q2, related to the second experience that they had experienced. Q1 and Q2 contained the same questions so that we would be able to compare the lived experience of participants for both tasks.

3.3 Questionnaires

Through the whole experience, three questionnaires Qo, Q1, Q2 were administered to both participants who completed them individually. Table 1 presents the constructs, their measurement items, and the questionnaire in which they were used.

Table 1. Constructs Measurement

Construct name	Items	Scale	Q.	Source
Pleasure	Please move the cursor on the scale to measure your level of pleasure.	from 1 to 100	Q_1 and Q_2	(Betella & Verschure, 2016)
Arousal	Please move the cursor on the scale to measure your level of arousal.	from 1 to 100	Q_1 and Q_2	(Betella & Verschure, 2016)

Satisfaction	1) I was very satisfied with the online shopping experience done with my partner 2) I was pleased with shopping with my partner online 3) *The online shopping with my partner was a frustrating experience* 4) *I had a terrible experience shopping online with my partner*	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q_1 and Q_2	(Bhattacherjee, 2001)
Perceived affective conflict	1) My partner or I often got angry while doing the online shopping together 2) My partner or I often showed annoyance during the online shopping we did together 3) My partner and I were frustrated shopping online together	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q_1 and Q_2	(Ma et al., 2017)
Perceived cognitive conflict	1) We experienced conflict of ideas during the online shopping with my partner 2) During the online shopping, we often had disagreements about the shopping we did 3) During the online shopping, we often had conflicting opinions about the task we were doing	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q_1 and Q_2	(Ma et al., 2017)
Continuance intention	1. I intend to continue shopping online with my partner 2. My intentions are to continue shopping jointly with my partner rather than any alternative *3. If I could, I would like to discontinue shopping online together with my partner*	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q_1 and Q_2	(Bhattacherjee, 2001)

Notes: · Italic items are negatively worded. Q1: Questionnaire administrated after task 1. Q2: Questionnaire administrated after task 2.

3.4 Behavior measurement

To be able to measure the participants' behaviors, we built upon two different coding schemes in order to create a new one adapted specifically to our research. We used the

combination of codes taken from the Couple Interactive Scoring System (CISS) (Snyder & Gottman, 1980) and other codes from Hall et al. (2005)'s study on the *nonverbal behavior and specific behaviors.*

3.4.1 Coding scheme and coders method

The Couple Interactive Scoring System (CISS), developed by Gottman (1979) and presented in their book *Marital Interaction: Experimental Investigations* is a microanalytic coding scheme commonly used to provide information about couple's the verbal interaction (Mekki Berrada, 2011). Using the CISS coding scheme, Brinberg and Schwenk (1985) have reduced the long list of codes to height categories. As our research aims at exploring the behaviors of the couples, focusing on their user experience, we chose to include Brinberg and Schwenk's (1985) smaller list of codes which summarizes the CISS, rather than the whole version of the CISS. We used five of those categories: *Agreement, disagreement, communication talk, problem solving, expressing feelings about a problem* (which is named *feeling about decision* in this paper) (Brinberg & Schwenk, 1985).

Other codes were taken from Hall et al. (2005) article on nonverbal behaviors. Their research consisted of examining the interpersonal relations (relating to dominance, power, and status) in association with nonverbal behaviors. Their coding scheme included facial behaviors, gaze, body movement, touch and more (Hall et al., 2005). In this paper, three codes were used from Hall and al.'s (2005) scheme because it was impossible for the coders to observe, on video, most of the participants' body movements, except from their upper limbs. The codes that are presented in this paper are: *interruption, loudness,* and *gestures.* To be able to code those behaviors for both the passive and active partners, we created the following codes: *passive interrupts (*when the passive partner interrupts the active one), *active interrupt*, *passive loud* and *active loud*.

Furthermore, since a couple's behaviors while shopping online together had not been the subject of extensive behavioral research before, new codes needed to be added so that behaviors relating to human-computer interactions could be included in this research.

These new codes were added for behaviors that were either expected from the start or that appeared while coding the first two videos. The codes that were in our coding scheme at the beginning and that were used are the following: *passive points the screen, passive controls, passive tells what to do, active is ignored, passive is ignored, negotiation*. The codes that were created and added after the codification of the first two videos are the following: *passive tells to click, passive tries to control, going fast*. A more specific definition of each behavior included in our coding scheme is presented in table 2.

After the data from the first two couples were collected and analyzed, we compared results between coders and between couples to find similarities and differences that could be further analyzed. We concluded that new codes needed to be created or derived from ones that were already in our coding scheme. For example, we initially had the code "*passive tells what to do*" but quickly adjusted and added "*passive tells to click*" because we noticed that the passive partner often told the active partner to click on something specific. The behavior *going fast* was also created after noticing that passive partners would tell their active partner to go (scroll or read) faster. Those iterations allowed the coders to separate these three behaviors (e.g. *passive tells to click, passive tells what to do* and *going fast*) to make it easier for future testing.

3.4.2 Categorizing the behaviors

To analyze the data at a higher level, we decided to separate the behaviors into six categories: the *passive partner's dominant behaviors*, *active partner's dominant behaviors*, *passive pacing*, *neutral common behaviors*, *positive common behaviors*, *and negative common behaviors.*

The *passive partner's dominant behaviors'* category was built and inspired based on the dyadic power theory and past research on dyads collaborating on a single computer. Control attempts are defined by Rollins and Bahr (1976) as someone's likelihood of using dominance as means of controlling the interaction. Dunbar and Burgoon (2005) added that extremely powerful individuals do not need to do large numbers of control attempts. Instead, according to the latest authors, control attempts will rather come from the partner

who perceives that they are less powerful (Dunbar et al., 2008). Informed by the dyadic power theory and the hypothesis derived from it, we built the *passive partner's dominant behaviors* category with behaviors that came only from the passive partner and that seemed to be executed by this partner in order to "control" the interaction (e.g. *passive points the screen, passive tries to control, passive controls, passive gestures, passives tells what to do, passive tells to click, active is ignored* and *passive is loud*). The *active partner's dominant behaviors* category was built similarly to the previous category but instead, the behaviors included only came from the controlling, active, partner (*passive is ignored*, *active is loud* and *active interrupts*).

The category *passive pacing* was first built with two behaviors: *going slow* and *going fast*. We coded those behaviors when the passive person would tell their partner to either scroll faster or slower or when they would comment on how fast or slow they were going. After processing our data, we noticed that *going slow* had not been used within the couples that were processed into the FaceReader software (some couples had bad video quality and could not be processed). The *going slow* code and was thus ignored for the rest of the research. The *passive pacing* category (which, at the end, only included the *going fast* verbal behavior) was kept separate from the other dominant behaviors. We decided to keep this code separated because as we coded the videos, we noticed that the *going fast* behavior seemed to be more of a request for the passive partner to be able to read the screen rather than a way to control the interaction. The name of the category is inspired by Amershi and Morris' (2008) research in which they identified pacing problems as an issue that co-located online collaborators often face.

Finally, three different categories were built for behaviors that were shared between both partners: positive, negative or neutral common behaviors. *Positive common behaviors* were defined as behaviors that helped towards reaching a decision. This category included *communication talk,* which is defined as a communication process in which the individuals talk about the topic and exchange positive comments (Brinberg & Schwenk, 1985) and included *agreements*. The *negative common behavior* category only included disagreements. For example, if a participant would say: "*That seems nice, would you like*

to try this activity?" and their partner answered: "*yes, let's look at the details*", that would be categorized as a *positive common behavior*, more precisely the *communication talk* behavior. In comparison, if the second partner had answered: "*No I hate canoeing*" and discarded their partner's comment, coders would have categorized the discussion as a disagreement because of the opposing ideas. The *neutral common behavior* category includes behaviors that were neither disruptive to the experience nor positive ones. This category includes three behaviors (problem solving, negotiation, feeling about decision) that are all related to discussion about which activity which they would like to purchase.

Table 2 presents the list of codes used to code verbal communication and nonverbal communication.

Table 2: Co-located collaborative online shopping coding scheme

Category	**Behavior**	**Description**	**Source**
Passive partner's dominant behaviors: Behaviors executed by the passive partner with the goal of gaining control over the collaborative task.	Passive points the screen	When the passive partner can be seen pointing at the screen.	New
	Passive tries to control	When the passive partner can be seen trying to use the keyboard, touchpad or mouse.	New
	Passive controls	When the passive partner can be seen controlling the mouse or keyboard.	New
	Passive gestures	When the passive partner can be seen gesturing while talking.	(Hall et al., 2005)
	Passive tells what to do	When the passive partner clearly tells the active partner what to do, where to click.	New
	Passive tells to click	When the passive partner tells the active one to click on something.	New

	Active is ignored	When the passive partner ignores what the active partner has said	New
	Passive is loud	When the passive partner suddenly says something louder than usual.	(Hall et al., 2005)
Active partner's dominant behaviors: Behaviors executed by the active partner with the goal of maintaining control over the collaborative task.	Passive is ignored	When the passive partner is being ignored by the active partner.	New
	Active is loud	When the active partner suddenly says something louder than usual.	(Hall et al., 2005)
	Active Interrupts	Active partner interrupts the passive partner.	(Hall et al., 2005)
Passive pacing: Behaviors executed by the passive partner with the goal of telling their partner to go faster.	Going fast	When the passive partner tells the active partner that they are going fast while using the computer.	New
Neutral Common behaviors: Behaviors that were neither negative or positive and that were executed by both partners.	Problem solving	When the couple tries to solve an issue, not related to a disagreement (e.g. *trying to understand how they would drive to the location of the activity*)	(Brinberg & Schwenk, 1985)
	Negotiation	When partners are negotiating to try to reach common ground (e.g. *we could buy this one activity if you let me do this.*)	New
	Feeling about the decision	When the couple is talking about their final decision.	(Brinberg & Schwenk, 1985)
Negative common behavior	Disagreement	Disagreement between both partners.	(Brinberg & Schwenk, 1985)
Positive common behavior	Agreement	Agreement between both partners.	(Brinberg & Schwenk, 1985)

	Communication talk	When partners ask each other what they think about an option or what they would like.	(Brinberg & Schwenk, 1985)

Two researchers coded the videos, and both were trained on The Observer XT (Noldus Information Technology Inc. Wageningen, Netherlands). The researchers discussed the coding scheme extensively before coding, to ensure that both understood all the codes and what differentiated each one. To make sure that both researchers coded identically, they first started by coding the same video and then went over the results and discussed disparities. Furthermore, when in doubt, one researcher would call the other one to make sure that they understood a specific situation the same way.

3.5 Video analysis

3.5.1 Facereader

The Lookback (Lookback Group Inc., Palo Alto, CA) software recorded the participant's faces during the whole experience. During the preprocessing phase, the video of each participant's face was uploaded to the FaceReader software v.8 (Noldus, Wageningen, Netherlands). The FaceReader software can extract the values for every participant's facial expression and classify these expressions in one of the basic universal emotional categories: happy, sad, angry, surprised, scared and disgusted (Ekman, 1992) and neutral.

Moreover, FaceReader is able to track the amount of positive and negative emotional reactions to then calculate the *emotional valence*. The participants' emotional valence is computed by subtracting the "negative" facial expressions from the "happy" facial expressions, the valence then ranges from 1 to -1 (Skiendziel et al., 2019). The software does not require participants to wear or do anything other than what they are asked to do during the task and captures the unconscious and automatic reactions of participants without interrupting the task (Skiendziel et al., 2019). Given its non-intrusive advantage, FaceReader has been used by researchers to understand human behavior and is useful to

compare the participants' lived experience with the one that they perceived (self-reported on the questionnaires).

While 40 couples participated in this study, only 36 couples (72 people) could be processed in the FaceReader software because of the video quality of certain participants.

3.5.2 The Noldus Observer XT

The Observer XT (Noldus Information Technology Inc. Wageningen, Netherlands) is a software that makes it possible to codify videos. It enables researchers to upload coding schemes and videos and makes it easy to code every video accordingly. Once our coding scheme, (table 2), was uploaded in the Observer XT, we imported the videos of the 36 couples, which had been recorded on Lookback, into Observer XT for the behavioral coding.

The researchers used the joint videos of the couple's screen paired with the couple's webcam video to code the participant's behavior. By being able to see the participants' screen, their faces and their upper bodies, researchers were able to code behaviors that included voice as well as body gestures. Each couple were coded separately, but partners in the same couple were coded simultaneously.

3.5.3 Post-processing

We paired coded videos with the FaceReader analysis which allowed us to run statistical tests to see if the emotional valence (computed with FaceReader software) was correlated with the behaviors coded with ObserverXT. For example, the combination of ObserverXT and FaceReader made it possible to see the active participant's valence value at that specific moment that the passive partner was pointing the screen.

3.5.4 Data analysis

For all our questionnaire data, we check if the variables were normally distributed. Shapiro-Wilk test showed that *pleasure, arousal, continuance intention, satisfaction* and

all types of *conflicts* were not normally distributed (p-value > 0.1), therefore we transformed them into binary variables using their median as a split point.

For our second research question, we ran multiple logistic regressions with random intercepts modelling the probability that the dependent variables had a value of "1", meaning that it was higher than their median. We used the random intercept method because of repeated measures. When analyzing data captured by the FaceReader software, we ran a linear regression with random intercept, both at participant level and at couple level. The goal of exploratory research, contrary to confirmatory research, is not to validate hypotheses (Jaeger & Halliday, 1998). Thus, for the multiple logistic regressions, we decided to keep the level of alpha to 90% to reduce the risk of type II error. It is also important to note that our p-values are two-tailed.

We ran two sets of multiple logistic regressions to find out which behaviors had an impact on the couple's collaborative shopping experience. The first set of analysis included every behavioral category (*passive partner's dominant behaviors, active partner's dominant behaviors, positive common behaviors, negative common behaviors, passive pacing and neutral common behaviors)* but we didn't check for any differences inside of the categories, meaning that all the different behaviors inside one category were considered as one whole for this analysis.

To deepen our understanding and analysis of the partners' interaction between each other and the computer, we conducted a second analysis using only certain behaviors and categories that were either more frequent or that seemed to generate more emotions for the participants. To choose which behaviors to include in the second set of regressions, we first ran single logistic regressions. We looked at the effect of each specific behavior on the participants' emotional state (pleasure and arousal), satisfaction, continuance intention and perceived cognitive and affective conflict. Finally, keeping only the significant results, we kept the following behaviors to include in this analysis: *passive tells what to do, passive points the screen, passive pacing, disagreements,* and *positive common behaviors*.

For each dependent variable, the frequency and the duration of the behaviors were used for the calculation of the regressions. The calculation of frequency is the same as the calculation used to answer our first research question, one occurrence of the behavior counted as 1 frequency. For the duration, we used the time from when the behavior started to when it ended. For example, using the *passive controls* behavior, we would start the timer when the passive partner took control of the computer until they would surrender the peripherals to their partner.

4. Results

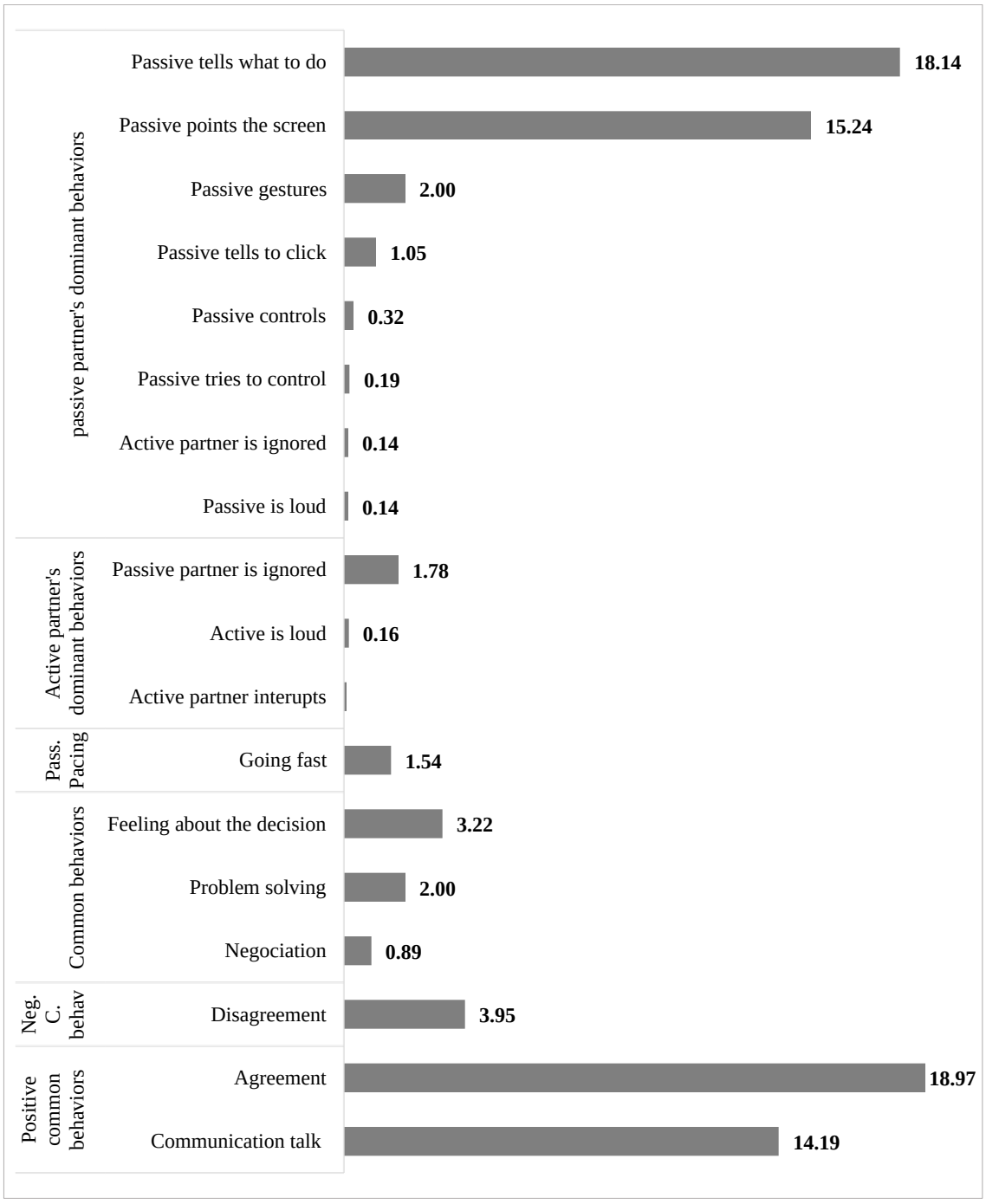
4.1 Frequency of the behaviors

To answer our first research question which asks which *behaviors do the controlling partner (active) and non-controlling partner (passive) engage in during the collaborative online shopping*, we computed the frequency per task of each behavior. Graph 1, presented below, shows the different behaviors and their average frequency per task. To compute the frequency, the behavior had to happen once to be counted as one occurrence. For example, if the passive partner pointed the screen and then lowered their hand, that counted as one occurrence, even if they brought their finger up again a couple of seconds later.

Certain verbal and non-verbal behaviors stood out from the others. *Positive common behaviors*, which include *agreements* and *communication talks* are some of the behaviors that were the most frequent, with their frequency being 18.97 times per task on average for the *agreements* and *communication talks* happening on average 14.19 times per task.

It is interesting to note that the other two most frequent behaviors were also in the same category: *passive partner's dominant behaviors*. Indeed, the *passive tells what to do* behavior occurred on average 18.14 times per task while *passive points the screen* occurred 15.24 times per task, on average.

Graph 1: Average frequency of behaviors per task



Moreover, we can observe that most passive partners did not try to control or take control of the computer while their counterpart was in the possession of the computer's peripherals. Another important point is that active partners seem to have exhibited very

low frequency of their own types of dominant behaviors, which is shown by the number of *active partner's dominant behaviors* codes (3 codes) compared to the *passive partner's dominant behaviors* category (8 codes).

4.2 Impact of the behaviors on the couple's user experience at category level

To answer our second research question, we conducted different statistical analyses. The next section presents the results of our first set of analysis which included every category of behaviors (*passive partner's dominant behaviors, the active partner's dominant behaviors, passive pacing, neutral common behaviors, negative common behavior* and *the positive common behaviors*) (section 4.2.1). We then present the second set of analysis that was done using only selected behaviors (*passive tells what to do, passive points the screen, passive pacing, disagreements,* and *positive common behaviors*), which is presented in section 4.2.2.

4.2.1 Results from the first analysis - category level

The table 3 shows the results of the first set of analyses. These statistical analyses were only done with the behavioral categories (*passive dominant behaviors, active dominant behaviors, positive common behaviors, negative common behaviors, passive pacing and neutral common behaviors*). Each significant result is also explained afterwards.

Effect on the passive user

Higher duration of the *passive partner's dominant behaviors* has created higher pleasure for passive users (b=0,0167, t(67)=1,83, p = 0,0716), while higher duration of *positive common behaviors* also resulted in higher pleasure in passive users (b=0,0061, t(67)=1,71, p = .091).

Higher frequency of *the passive partner's dominant behaviors* has had a significant effect which resulted in higher intention to do the experience again (b=0,0514, t(67)=1,84, p = .070).

Table 3 – Significant results from the first set of analysis – category level

Behavior categories		**Active partner**							**Passive partner**						
		Satis	Pleas.	Arous.	Cog	Aff	C. Int.	Val.	Satis	Pleas.	Arous.	Cog	Aff	C. Int.	Val.
Passive partner's dominant behaviors	Freq.				**+ 0.017**	**+ 0.071**								**+ 0.070**	
	Dur.				**+ 0.067**					**+ 0.072**	**+ 0.093**	**+ 0.056**			
Active partner's dominant behaviors	Freq			**- 0.072**											
	Dur.														
Passive pacing	Freq.	**- 0.051**				**+ 0.051**									
	Dur.														
Common behaviors	Freq.														
	Dur.						**- 0.001**								
Positive common behaviors	Freq.				**- 0.008**							**- 0.099**			
	Dur.						**+ 0.008**		**+ 0.045**	**+ 0.091**					
Negative common behaviors	Freq.					**+ 0.034**			**- 0.042**						
	Dur.											**+ 0.086**	**+ 0.049**		

Notes: 1) The direction of the result is shown by the - and the +, followed by the *p value*.

2) For example, looking on the active partner side, for the passive pacing category, we understand the more (in frequency) the passive partner tells their other half to go faster, the lower the active's satisfaction was.
3) The p-values are presented and are two-tailed.
4) Abbreviations: Satis.=Satisfaction, Pleas.=Pleasure, Cog.=Cognitive conflict, Aff.=Affective conflict, C. Int.=Continuance intention, Freq.=Frequency, Dur.=Duration

Higher frequencies of *negative common behaviors* has negatively affected the passive users' satisfaction (b=-0,3127, t(67)=-2,07, p = .042), while longer duration of *positive common behaviors* created higher satisfaction (b=0,0067, t(67)=2,04, p = .045).

Higher duration of the *passive partner's dominant behaviors* resulted in higher arousal for the passive person (b=0,0153, t(67)=1,7, p = .093).

As for the perception of conflict, higher duration of the *passive partner's dominant* behaviors created higher cognitive conflict (b=0,0179, t(67)=1,94, p = .056). Moreover, without any surprise, higher frequencies of *positive common behaviors* resulted in lower cognitive conflicts (b=-0,0574, t(67)=-1,67, p = .099). Higher frequencies of *negative common* behaviors had positive effect on all types of conflicts, meaning that the more partners exhibited *negative common behaviors*, the more the passive participant perceived cognitive conflict (b=0,2101, t(67)=1,74, p = .086) and affective conflict (b=-0,2781, t(67)=2,01, p = .049).

Effect on the active user

Higher duration of *positive common behaviors* resulted in higher intention (b=0,0131, t(67)=2,75, p = .008) for active users to do the experience again with their partner while higher duration of *common behaviors* affected negatively the active user's continuance intention (b=-0,0051, t(67)=-2,84, p = .006).

The more the active user was told to go faster by their passive partner (*passive pacing*), the less they were satisfied by their experience (b=-0,6775, t(67)=-1,99, p = .051).

The more the active partner exhibited *dominant behaviors* themselves, the lower they rated their arousal after each task (b=0,0167, t(67)=1,83, p = .072).

The more and the longer the passive partner would engage in *passive dominant behaviors*, the higher the active partner perceived cognitive conflict (Frequency: b=0,0858,

t(67)=2,46, p = .017) (Duration: b=0,0176, t(67)=1,86, p = .067). Higher frequencies of *the passive partner's dominant behaviors* also positively affected the active's perceived affective conflict (b=0,05968, t(67)=1,83, p = .071). Moreover, the more the passive partner would tell the active one to go faster (*passive pacing*), the more the active partner perceived affective conflict (b=0,72, t(67)=1,98, p = .051). Higher frequencies and higher duration of *positive common* behaviors have impacted the active's perception of cognitive conflict. Higher frequencies of *positive common* behaviors also lowered the active's perception of cognitive conflict (b=-0,1217, t(67)=-2,75, p = .008). Higher frequencies of *negative common* behaviors have heightened the active's perception of affective conflict (b=0,3244, t(67)=2,16, p = .035).

4.2.2 Results coming from the second analysis

The second set of analysis, as described in the data analysis section, included only certain chosen behaviors and categories of behaviors (*passive tells what to do, passive points the screen, passive pacing, disagreements,* and *positive common behaviors*). The table 4 summarizes the results from this second analysis.

Effect on passive user

Higher duration of the passive partner *pointing the screen* resulted in heightened pleasure (b=0,2744, t(58)=2,23, p = .030).

Longer periods of the passive user t*elling the active user what to do* (b=-0,098, t(58)=-1,84, p = .071) and longer *disagreement* periods (b=-0,3979, t(58)=-1,98, p = .053) both affected negatively the passive partner's satisfaction. On the contrary, higher frequencies of *positive common* behaviors resulted in higher satisfaction (b=0,0115, t(58)=1,9, p = 0,0619).

Higher duration of *disagreements* has created higher arousal for the passive user (b=0,5897, t(58)=2,19, p = .032).

Table 4 – Results from the second set of analysis

Behaviors or **category of behaviors**		**Active partner**							**Passive partner**						
		Satis	Pleas.	Arous.	Cog	Aff	C. Int.	Val.	Satis	Pleas.	Arous.	Cog	Aff	C. Int.	Val.
Passive points the screen	Freq.							**+ 0,046**							
	Dur.						**+ 0,006**			**+ 0,030**		**+0,094**			
Passive tells what to do	Freq.				**+ 0,057**							**+ 0,056**			
	Dur.	**- 0,087**					**- 0,062**		**- 0,071**						**+0,053**
Passive pacing	Freq.											**+0,052**			
	Dur.			**- 0,097**											
Positive common behaviors	Freq.				**- 0,004**				**+0,062**			**- 0,018**			
	Dur.														
Disagreements	Freq.								**- 0,053**						**+ 0,030**
	Dur.				**- 0,083**						**+0,032**	**- 0,096**			

Notes: 1) The direction of the result is shown by the - and the +, followed by the *p value*.

2) For example, looking on the active partner side, for the passive points the screen category, we understand the more (in frequency) the passive partner points the screen, the higher the active's valence was.
3) The p-values are presented and are two-tailed.
4) Abbreviations: Satis.=Satisfaction, Pleas.=Pleasure, Cog.=Cognitive conflict, Aff.=Affective conflict, C. Int.=Continuance intention, Freq.=Frequency, Dur.=Duration

Higher duration of *passive telling what to do* has resulted in higher valence for the passive user (b=0,1003, t(58)=1,97, p = .053) and higher frequencies of *disagreement* had the same effect positive effect on the passive's valence (b=0,4463, t(58)=2,22, p = .030).

Higher duration of the passive person telling their partner to go faster (*passive pacing*) created more perceived cognitive conflict (b=0,9699, t(58)=1,98, p = .052). Also, the longer the passive user would *point at the screen*, the more they perceived cognitive conflict (b=0,1458, t(58)=1,7, p = .094). Higher frequencies of passive partners *telling what to do* also resulted in perceiving higher cognitive conflict (b=0,2185, t(58)=1,95, p = .056).

Without any surprise, higher frequencies of *positive common behaviors* created lower cognitive conflict (b=-0,1364, t(58)=-2,43, p = .018). Higher duration of *disagreement* also resulted in lower perceived cognitive conflict (b=-0,12, t(58)=-1,69, p = .096).

Effect on active user

Surprisingly, higher duration of the passive person *pointing the screen* created higher continuance intention for the active user (b=0,3963, t(58)=2,84, p = .006) while higher duration of the active person *being told what to do* has impacted negatively their intention to do the experience again (b=-0,1204, t(58)=-1,9, p = .063).

The longer the active partner was being *told what to do*, the lower their satisfaction was (b=-0,0870, t(58)=-1,74, p = .087).

Higher duration of the passive person *saying to go faster (passive pacing)* created lower arousal for the active participant (b=-1,0414, t(58)=-1,68, p = .098).

Higher frequencies of passive *pointing the screen* resulted in a higher valence for the active partner (b=0,1557, t(58)=2,04, p = .046).

The more the passive user *told what to do to* the active user, the more the active partner perceived cognitive conflict (b=0,2455, t(58)=1,94, p = .057). Higher frequencies of *positive common* behaviors created lower perceived cognitive conflict (b=0,-1875, t(58)=-2,96, p = .005). Higher duration of *disagreement* created lower perceived cognitive conflict (b=-0,1191, t(58)=-1,76, p = .083).

5. Discussion

It is interesting to note how the category *passive partner's dominant behaviors* seem to mainly have an impact on the active partner's perception of conflicts. On the other side, the passive partner (who is the person engaging in those dominant behaviors) is more aroused, has more pleasure and higher continuance intention when they are doing more dominant behaviors. In this section, we discuss results that came from the two different sets of analysis combined.

5.1 Four key behaviors happened more often during the collaborative browsing

To answer our first research question which tackles the types of behaviors in which the controlling partner (active) and the non-controlling partner (passive) engage in, we looked at the frequency per task of all the behaviors coded during the collaborative online shopping. Four behaviors were observed more often during the collaborative online shopping. We look at two different categories that stood out from the list of codes.

5.1.1. Positive common behaviors

First, couples seemed to be very positive in their conversation. Indeed, agreements were observed on average 18,97 times per task and communication talk was observed on average 14,19 times per task. Overall, the collaborative shopping tasks were non-confrontational, meaning that we did not want to intentionally start any disagreements, which may explain why there was way more agreements than disagreements, which occurred 3.95 times per task on average.

In the section 5.2.3 which discusses the results for the second research question, we also discuss how positive common behaviors have affected the participant's emotional state, satisfaction, and their perception of conflict.

For future research, it would be interesting to intentionally put the couples in a situation where there could be more disagreement to observe and see if different behaviors would have emerged from the collaborative task. Overall, none of the disagreements turned into real conflicts that were observable by the coders and user test moderators.

5.1.2 The passive partner's dominant behaviors

Second, we noted that two other behaviors were observed more often during the user tests. Those behaviors, *passive points the screen* and *passive tells what to do* are both under the same category, the *passive partner's dominant behaviors*. Part of our coding scheme was influenced by Stewart et al.'s (1998) research on children sharing a screen which showed that non-controlling children tend to issue orders, point at the screen and fight over control. In our case, we found that *pointing the screen* was a very frequent behavior, which happened on average 15.24 times per task and that the passive partner would often *tell their partner what to do* (on average 18.14 times per task). Comparing our results to those of Stewart and al. (1998) in which the children would fight for control, we noticed that not every couple included in our research had instances when the passive partner tried to get control of the computer or took control of the computer. Indeed, on average, the passive partner tried to control the computer 0.19 times per task while taking control 0.32 times per task. It is important to note that none of the partners fully exchanged control of the computer during a task, the participant who started with control at the start of the task all finished with control over the computer.

Also, when exploring our video data, we noticed that *control attempts,* as described above by Rollins et al. (1996), often came from the non-controlling partner (passive partner) more than from the controlling partner (active). For this reason, the *passive partner's dominant behaviors* category is much larger and is separated into 8 behaviors while the *active partner's dominant behaviors* category is derived into 3 behaviors.

We explain this observation with the dyadic power theory, more precisely using Dunbar and Burgoon (2005) revisited theory which explains that people who perceive that they have less power than their partner will exercise more dominance (Dunbar & Burgoon, 2005). It could be hypothesized that the passive partner engaged in dominant behaviors as a way to compensate for their lack of control over the computer. It could be of interest, in future research, to interview participants at the end of the task to ask why they pointed at the screen, or why they were very vocal (issuing orders) and not letting their partner browse at their own pace. This kind of interview could provide important insight on the *why* behind the behaviors.

5.2 Effect of the behaviors on the couple's user experience

To answer our second research question which tackles the effect of the behaviors coded on the participants' user experience, we tested if the different dimensions of the couple's emotional state, their satisfaction, continuance intention and perceived cognitive and affective conflict were impacted by each behavior category and also by certain specific behaviors. We found that the couple's user experience was mostly impacted by five key behaviors (*passive points the screen*, *passive tells what to do* and *passive pacing**)*** or categories of behaviors (the *passive partner's dominant behaviors*, *positive and negative common behaviors*).

5.2.1 What happened when the passive partner engaged in more dominant behaviors?

It was found that the longer the passive participant exhibited dominant behaviors (such as *pointing the screen*, telling the active person *to click on something, trying to control the computer, interrupting* the active user while they were talking, *gesturing,* and *telling what to do, ignoring the active partner* and *being loud*) the higher their pleasure was during the collaborative online shopping. We also found that higher frequencies of the passive partner doing dominant behaviors heightened their intention to do the experience again. It seems like passive partners enjoyed *being dominant* during the interaction, maybe because they felt like they were more in control even though they were not. This finding makes sense when compared to other studies, conducted in different contexts, where

control has been manipulated by the researchers. For example, in the gaming industry, control is one of the main features that triggers emotional response (Schrader & Nett, 2018). The lack of control in gameplay is seen as frustrating and angering, while being in control is viewed as more enjoyable. A research done by Shrader and Nett (2018) shed light on the effects of user control levels on the emotional trends of students while playing an educational game. Their results showed that students in the moderate and high control game version reported more enjoyment and less frustration and anger. Indeed, active control, as a dimension of interactivity with the interface, has been linked to greater cognitive involvement and satisfaction (Oh et al., 2014). It is then logical to hypothesize that the passive partner felt more pleasure or rated their intention to do the experience again higher. Indeed, we can assume that when they were being more dominant, they were also feeling more in control over the experiment.

Another interesting finding is that higher duration of the passive partner engaging in dominant behaviors have heightened the passive partner's arousal while it has done the contrary for active users. Indeed, the more the active partner exhibited dominant behaviors (ignoring or interrupting the passive partner as well as being loud), the lower they rated their arousal. Arousal is defined as being either sleepy or wide-awake by the affective slider definition (Betella & Verschure, 2016) and as discussed in the background literature, it is a component of being in a state of flow. Being in a state of flow also means that you are wide-awake and attentive to what you are doing (Csikszentmihalyi, 1990). We understand that those *active partner's dominant behaviors,* contrary to the *passive partner's dominant behaviors* did not impact the arousal of each partner the same. Using the flow theory, we can hypothesis that passive partners who exhibited more dominant behaviors were probably more involved or compelled by the collaborative shopping with their partner (more in a state of flow), whilst for the active partner, doing dominant behaviors might have broken their state of flow, explaining their lower arousal rating. Thus, knowing that being *more dominant* also meant that the passive partner was probably participating more (by pointing the screen, speaking more, gesturing more, etc.), it seems normal for the passive participant to have felt more aroused. On the other hand, the passive's higher arousal could be explained by the reactance theory. Research focusing

on the reactance theory have shown that people's arousal level increased when they were confronted with uncontrollable events, this too could be a future hypothesis on why passive participants precisely felt more aroused as they did more dominant behaviors (Steindl et al., 2015).

It was found that the more and the longer the passive participant engaged in *dominant behaviors*, the more both the passive and the active partners seemed to both perceive cognitive conflict, with the active person also perceiving more affective conflict. It is important to remember that cognitive conflicts are functional ones that enhance the decision quality (Amason, 1996). These types of conflict are seen when teams debate their perspective or when there is communication during the decision process and, as a result, cognitive conflict should enhance commitment (Amason, 1996). However, affective conflicts are associated with emotional clashes and emotions such as dislike, annoyance, anger and frustration (Ma et al., 2017). Affective conflicts are dysfunctional, and they seem to emerge in teams when cognitive disagreement is perceived as a personal criticism (Ma et al., 2017). Thus, the active partner perceived affective conflict the longer the passive partner engaged in dominant behaviors, meaning that their experience was altered negatively by these behaviors. On the other hand, the passive participant did not perceive more affective conflict as they engaged in dominant behaviors, but they did perceive more cognitive conflict. To them, their dominant behaviors could have been helpful in the decision making (as they might have felt that they were participating more) and that is also considering that the p*assive partner's dominant behaviors* brought them (passive partner) more pleasure, arousal and higher continuance intention.

5.2.2 The effect of pointing the screen and telling your partner what to do

Diving into specific behaviors, the longer the passive partner *pointed at the screen*, the more they enjoyed their experience. Interestingly, the more the passive partner *pointed at the screen*, the higher the active user rated their intention to do the experience again, meaning that *pointing the screen* was not a detrimental behavior to the overall collaborative shopping experience. We found that this result is also supported by the analysis of the valence, which revealed that the more frequently the passive partner

pointed at the screen, the higher the active's valence was. Active and passive participants might have somewhat enjoyed the precision of the pointing behavior; It is indeed more precise for the active partner to have their passive counterpart pointing at what they are talking about than having to guess. It could be interesting, in future research, to separate this type of behavior from other behaviors that were revealed as detrimental to the collaborative shopping. Moreover, the more the passive partner *pointed the screen*, the more the perceived cognitive conflict, showing that this movement is possibly not *bad* behavior.

Longer periods of the passive partner *telling their active counterpart what to do* affected negatively the satisfaction of both partners as well as the continuance intention of the active partner. Adding to this finding, both partners perceived more cognitive conflict, either because of higher frequency or longer periods of the passive partner *telling what to do*. In the same vein, being *told to go faster* has negatively impacted the satisfaction and arousal of the active partner as well as heightened their perception of affective conflict. Two categories of behaviors have affected the active partner's perception of affective conflict: *passive partner's dominant behaviors* and the *passive pacing* category. We hypothesize that these types of behaviors (*being told what to do* or *to go faster*) are more detrimental to the collaborative online shopping because being told what to do is more confronting than being shown (pointing) something on the screen.

5.2.3 The impact of positive and negative behaviors common to both partner

Not too surprisingly, *positive common behaviors* are correlated with both partners perceiving less cognitive conflict. *Negative common behaviors* have, contrary to *positive behaviors*, heightened the active's perception of affective conflict while it has heightened the two types of conflict for the passive partner.

An interesting result is that both partners perceived less cognitive conflict as they experienced higher duration of *disagreement* periods. We can explain this outcome knowing that cognitive conflicts are functional ones. Indeed, if it was possible for coders to notice that the couple was having a disagreement, it also means that the partners were

discussing their different opinions out loud, maybe deconstructing the conflict by talking about it.

6. Limitations and Conclusion

Having couples do an online shopping task has its obstacles and limitations. First, it is important to note that the sample presented in this study does not have the most diverse background. Indeed, most of our participants are in the same age group, have a bachelor's degree and have been together for more than a year. Also, only two of our couples were not heterosexuals. It could be interesting for future research to engage with a more diverse sample, having people come from different cultures, education levels, age and sexuality.

Moreover, many collaborative shopping experiences are happening on multiple days and longer periods of time than the timeframe in which our experiment took place. For example, when shopping for travel, couples might find themselves looking at flights and hotels for multiple days, even several weeks before sitting together and making their final choice. Our study, which is on a smaller scale, allows for initial exploration of the co-located collaborative online shopping which has not been thoroughly researched before.

For the purpose of our study and being able to follow what was displayed on the couple's computer, we did not allow participants to use other devices to browse online. It would be interesting to see if certain behaviors would have naturally emerged if this restriction had not been there. Additionally, in their "everyday life", partners are likely to naturally be the active partner or the passive partner, which may distort some of the effects.

Our exploratory research allowed us to further our understanding of the types of behaviors that partners engage in while shopping online together. We hypothesized that the passive partner would compensate for their lack of control with dominant behaviors, or control attempts. More specifically, we also hypothesized that being told what to do while being in control of the peripherals is not a good experience for the active partner. It would be interesting for websites that are known to be browsed by dyads (e.g. house hunting

websites, travelling websites, home furniture) to facilitate the co-located browsing experience and help decrease these behaviors.

From the results of this research, we find that there are two more specific important takeaways for future research, and which could be very interesting for e-retailers to consider. First, when the passive partner engages in more dominant behaviors, their arousal, pleasure, and continuance intention all get heightened. As for the active partners, when their partner engages in those dominant behaviors, they perceive higher cognitive and affective conflict. This result shows that it could be beneficial for the experience to have the partners switch controls during the collaborative shopping, which could potentially heighten the emotional state (pleasure and arousal), the satisfaction and the continuance intention of both partners. As for the second takeaway from this research, we found couples who shop together will often have one partner overseeing the browsing or shopping experience while the other is controlling the computer. The passive partner will most likely tell what to do to their partner, which is a source of conflict for the active partner and decreases their chances of wanting to reproduce the experience. Finding solutions to alleviate this behavior could potentially be important for the e-retailers who want couples to come back to their websites.

Finally, we believe that our research helped frame certain behaviors which happen between partners in a romantic relationship while collaboratively shopping online together on a single computer. We strongly believe that it is important for online retailers to understand how their shoppers use their websites, and that they need to go beyond being only “user friendly” and pleasant to look at. While there is still a gap in the literature on the subject of co-located collaborative shopping, we think that our results might bring us closer to understanding how to build a better experience for users shopping together. Indeed, we believe that our exploratory research might inform and pave the way to finding innovative solutions that might bring the two partners to switch the control of the device instead of having only one of them controlling the computer for the whole shopping experience. For future research, it could be interesting to ask participants to switch control

between each other in order to find out if the experience is more pleasant for both partners.

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Chapitre 3
Sharing a Screen While Shopping Online: The Effects of Device Control and Taking Turns on a Couple's User Experience

Abstract

Although e-commerce interfaces tend to be designed for solitary usage, they are often shared by users (e.g., when shopping for travel). In this paper, we present an experiment conducted with 40 real-life couples who interchanged the computer's control while shopping online together. Participants' pleasure, arousal, perceived affective conflicts, and continuance intentions were measured. The quantitative results highlight three key findings: 1) Participants' pleasure, arousal, and continuance intention were significantly higher when they were in control; 2) The deviation in pleasure, arousal, and continuance intention between partners attenuates when they took turn in having control; 3) Participants' perceived affective conflicts, which can emerge in situations of power asymmetry, had a negative effect on participants' continuance intentions. Our results show that device control has an effect on a couple's collaborative shopping experience. We conclude with recommendations to help UX designers create digital environments that generate more enjoyable experiences for couples shopping online.

1. Introduction

More than a decade ago, a survey conducted with 204 Microsoft employees reported that 87,5% of respondents had "watched over someone's shoulder when they searched the web" either for holiday planning, shopping tasks, or for student projects (Morris, 2008). Often, the passive person would suggest words to search or where to click to their active counterpart. This survey is one of many indicating that co-located collaborative browsing is a prevalent practice, and yet a vast majority of search tools and websites remain designed for solitary tasks (Morris, 2013).

Co-located collaborative browsing is particularly common in the context of couples shopping online together. When couples shop for a product or service to be 'consumed'

together (e.g., furniture, movie, travel), they often end up in a situation where one person has control over the browsing device (e.g., the mouse) while the other, co-located, comments on (and sometimes directs) their partner's navigation (Stewart et al., 1998). Surprisingly, little research has examined how the shopping experience is affected by such a setup, where control over the browsing device (e.g., having or forgoing control, taking turns in controlling) becomes an essential dimension of each user's interaction with the computer interface and their collaboration with their significant other.

Against this backdrop, we set out to explore how dyads, and more precisely couples, share a computer (its screen, mouse, and keyboard) and interact during a collaborative shopping task. More specifically, our study addresses three main research questions: (1) How does having control over the browsing device influence the online shopping experience of couples? (2) What is the effect of taking turns in controlling the browsing device on the couple's experience? (3) How do the conflicts that can emerge in a situation of device control asymmetry affect their intention to continue shopping together?

Our quest to answer these questions relied on three key streams of research. First, *flow theory* informed our hypothesis linking user control to the partners' emotional state (composed of valence and arousal) (Webster et al., 1993). Second, *social exchange theory* led us to propose that giving away control to one's partner after being in control might level the experience of both partners. Third, the literature on *asymmetric power dynamics* within couples guided us to theorize on the negative influence of conflicts on each partner's experience (Hurt & Welbourne, 2018). Combining these three theoretical frameworks offers the opportunity to develop a more comprehensive explanation of the challenges faced by couples while they co-locatively shop together and suggests ways to cope with them effectively.

To test our hypotheses, we conducted an experimental study with 40 real-life couples engaging in co-located collaborative online shopping with their own computer at home. Each couple had to complete two consecutive shopping tasks. For each task, we manipulated control such that each member of the dyad was in control of the browsing device once. Our focus was on examining the process of how having, surrendering, and alternating control affected the members of the dyad. In doing so, we collected data on

the partners' emotional state (i.e., pleasure and arousal), their perceptions of affective conflict, and their intentions to repeat the co-located collaborative online shopping experience in the future. Our focus on affect was motivated by the observation that couples tend to base their decision to shop together based not only on the need to fill a mutual need (e.g., buying a house) but also on the expectation of having fun during the activity (Lim & Beatty, 2011).

In the remainder of this paper, we provide some theoretical background, present our hypotheses, describe our methodology and results, and discuss research avenues and practical implications. We conclude with practical recommendations for user experience (UX) designers.

2. Background Literature

2.1 Online collaborative behaviors

Collaboration is defined as the joint effort of a group towards a goal (Briggs et al., 2009). In addressing this phenomenon, researchers have turned to the role of supporting information technology (IT) capabilities (Schouten et al., 2010), an unsurprising focus given organizations' increased reliance on collaboration platforms to support and increase efficient remote teamwork (Lehrig et al., 2017). Human-Computer Interaction (HCI) researchers have been particularly active in studying IT-supported collaboration. In the late 80s, a system called *CRUISER* was created (Root, 1988), which introduced the concept of social browsing. *CRUISER*'s primary goal was to support cooperative work through an interface. The idea of social browsing was carried over by other researchers who created an array of systems, for all types of collaboration. Systems were created to allow collaborators to browse the web in real-time together, remotely (Shah, 2014). For example, *SearchTogether* enabled collaborators to search the web remotely, whether synchronously or asynchronously (Morris & Horvitz, 2007).

Note that different terms have been used to describe relatively similar online collaborative behaviors. For example, collaborative information seeking (CIS) has been defined as individuals seeking information online to solve a shared issue (Poltrock et al., 2003; Tao

& Tombros, 2017). Collaborative browsing has been defined as multiple people browsing the web together, either remotely or co-locately, to achieve a common goal (L. Gao & Bai, 2014). In the present study, our focus is on co-located collaboration in the particular context of couples shopping online together.

2.2 Co-located collaboration

One important nuance in understanding online collaborative behaviors is that they may involve browsing the web together either on the same computer (i.e., co-located usage) or from two different computers (i.e., remote usage). Previous work on co-located online browsing found that users who were in control of the browsing device felt like they were significantly more engaged than the ones who were observing / who could not control the device (Amershi & Morris, 2008). Another study highlighted the effectiveness of creating personalized views of Web pages for co-located users based on the devices they are currently using (Han et al., 2000). In the context of children collaborating using a shared computer (one sole mouse and keyboard), research found that kids fought for control of the input devices and that those who were in a passive role pointed at the screen and issued orders to their active partner (Stewart et al. 1998).

Online collaboration is particularly prominent in the context of online shopping (Tchanou, Léger, Senecal, et al., 2020). Collaborative online shopping is a form of collaborative browsing that involves individuals seeking to purchase something together. This too can be executed as users are either co-located or physically distant (L. Gao & Bai, 2014). Collaborative online shopping requires that individuals collaborate with their friends, family, or colleagues to work around multiple issues (e.g., agreeing on the decision-making process).

3. Hypothesis Development

3.1 The Impact of Device Control on Couples' Online Shopping Experience

In today's traditional computing environments, users control what they want to see and manipulate on their screen using simple input devices like a mouse, a touchpad or a

keyboard (Wise & Reeves, 2007). Having active control is essential because, as a dimension of interactivity, it is thought to lead to greater cognitive involvement and satisfaction (Liu & Shrum, 2002). In this research, we define "control" as the users' ability to manipulate a computer's browsing device to decide on the content of a web page and on the pace of presentation of the content.

In the next paragraphs, we leverage the lenses of flow theory and social exchange theory to theorize on the role of control in the specific context of co-located couples shopping together using a shared computer.

3.1.1 Flow theory

Flow theory provides a useful framework to examine the effects of device control on collaborative shoppers' experience. It proposes that the state of flow constitutes an optimal and enjoyable experience, in which individuals feel in control of their actions and feel a sense of exhilaration (Csikszentmihalyi 1990; Hsu et al. 2012). Flow can happen when people are engaging in any activity, be it reading, doing sports, working, or using a website (Hsu et al. 2012).

A first inference we draw from flow theory is that being in a state of flow is an emotional experience. To better theorize on the effect of *being in a state of flow* on the user's experience, we must look into the user's different emotional dimensions, which are not directly explained by the flow theory. Thus, we know that emotions can be conceptualized in terms of two dimensions: 1) valence, the extent of pleasure experienced, and 2) arousal, the level of intensity felt during an experience (Posner et al. 2005). In flow theory, valence maps to the concept of enjoyment, and arousal maps to the sense of exhilaration. Note that the concept of flow is closely related to that of cognitive absorption, which represents "a state of deep involvement with a software" (Agarwal and Karahanna 2000, p.673). Cognitive absorption is reflected in five dimensions, three of which also point to a positive association between control, pleasure, and arousal: 1) control represents the user's perception of being in charge of the interaction, 2) pleasure stands for the extent of enjoyment during the interaction, and 3) curiosity refers to the arousal of the users' sensory and cognitive curiosity (Agarwal & Karahanna, 2000).

A second conjecture of flow theory is that experiencing flow motivates individuals to experience it again, thus to engage more with the artifact mediating the experience (e.g., the computer, the website, the app) (L. Gao & Bai, 2014). When customers find an experience to be pleasurable, they want to repeat it (Bridges & Florsheim, 2008; L. Gao & Bai, 2014; Hsu et al., 2012). In fact, several studies have observed this relationship, such as in the context of mobile social networking services (L. Gao & Bai, 2014) and online shopping (Hsu et al. 2012). Continuance intention, defined as users' intention to keep using a particular computerized system in the future (Bhattacherjee, 2001), is critical for the success of e-commerce websites. In this paper, the definition of continuance intention is extended to represent a user's intention to continue shopping online using a shared computer with their co-located spouse.

In light of flow theory and its application in the online shopping literature, we propose the following two hypotheses:

> H1a: Device control will influence users' emotional state such that active users will experience more positive emotions compared to their passive partners.
>
> H1b: Device control will influence users' intention to keep shopping online with their partner such that active users will report higher continuance intentions compared to their passive partners.

3.1.2 Social exchange theory

We turn to social exchange theory to further examine the relational process between two partners who exchange control during a co-located collaborative shopping experience. Social exchange theory considers families as systems in which emotions and resources are exchanged in order to support the relationship (Fiske, 1992). Socially embedded individuals (e.g., couples) behave in a certain way as a result of an exchange process. Partners make transactions of valued resources (tangible and not tangible) and weigh the potential benefits (e.g., pleasure, satisfaction, fun) and costs (e.g., having to put money and time into the relationship) associated with these transactions. They want the benefits to outweigh the costs and behave accordingly (Nakonezny & Denton, 2008).

H1 proposes that device control influences partners' emotional state and continuance intentions, and this suggests that the partner who is in control of the mouse will have a better experience than their counterpart. Social exchange theory further suggests that when the active partner proceeds to transfer control to their previously passive partner, the active person contributes to restoring balance in the relationship, a cooperative act that can reduce negative feelings like guilt while enhancing the positive feelings induced by reciprocating (Poulsen, 2019). This reasoning suggests that the difference in pleasure and continuance intention induced when one partner starts with controlling the browsing device should decrease when control is exchanged between partners. Accordingly, we suggest the two following hypotheses about the evolution of partners' emotional state and continuance intention as control is transferred from one partner to the other:

H2a: The deviation in the emotional state within the couple attenuates when partners interchange control of the browsing devices.

H2b: The deviation in continuance intention within the couple attenuates when partners interchange control of the browsing devices.

3.2 The Impact of Conflicts on Couples' Online Shopping Experience

Collaborating can be time-consuming and impeded by several factors including power inequalities between a group's members (Shah, 2014). Therefore, it is no surprise that collaboration, including collaborative shopping, is often generative of conflicts. Conflict is defined as any social situation or process in which two or more entities are linked by at least one form of opposing psychological relation or one form of opposing interaction (Hurt & Welbourne, 2018). Opposing ideas, differences regarding personal issues are well-known triggers of conflict, and so can be a situation wherein partners have to fight over computer control (Stewart et al., 1999). In fact, conflicts have proven to arise particularly when there is a difference in power between group members (Coleman et al., 2014). In these circumstances, cooperating and working together can be frustrating and inefficient, especially when collaborators disagree (Amershi & Morris, 2008).

Two types of conflicts are often distinguished: cognitive and affective conflicts (Amason, 1996). Cognitive conflicts are task-related and occur when group members have opposing ideas and opinions. Thus, they are often perceived to be productive and to lead to greater decision-making quality. In contrast, affective conflicts tend to induce negative emotions like boredom, annoyance, anger, and frustration (Ma et al. 2017).

In this research, we focus on the affective dimension of conflict because it is particularly dysfunctional and detrimental to decision-making (Amason, 1996; Hurt & Welbourne, 2018). The literature suggests that when team members experience affective conflicts, the team might become inefficient as members struggle to engage in constructive discussions about the task at hand (Hurt & Welbourne, 2018). Thus, affective conflict can initiate negative affective responses (Hurt & Welbourne, 2018), leading to emotional clashes and tensions that will eventually influence the task-related effort (Parayitam & Dooley, 2009).

Furthermore, affective conflicts are more likely to generate withdrawal behaviors, such as refusing to collaborate further with another person or team and becoming less committed to the team or task at hand (Hurt & Welbourne, 2018). This is because one common way to cope with conflicts when they surge is by using an avoidance strategy, which consists in steering clear of the stressor (Pearlin & Schooler, 1978; Stanwell-Smith, 2004).

Considering the influence of affective conflicts on people' emotional states and avoidance/distancing behaviors, we propose the two following hypotheses:

> H3a: Perceived affective conflict will negatively influence each partners' emotional state.
>
> H3b: Perceived affective conflict will negatively influence each partners' continuance intention.

4. Research method

4.1 Experimental Design

To test the hypotheses, we conducted an online shopping experiment with real life couples. We used one within-subject factor (i.e., whether each participant in the couple was in control of the browsing device) design. This experiment was approved by the ethics committee of our institution.

4.2 Sample

We recruited 40 couples, 90% of which had been involved in a romantic relationship together for more than a year at the time of the experiment (47.5% of the couples had been together for more than 3 years and 42.5% between 1 and 3 years). Their average age range was between 18 to 25 years old and their average level of education was a bachelor's degree. With respect to gender, 42 participants self-declared as men, 37 as women, and one as non-binary.

4.3 Procedure

One day prior to the experiment, each participant was instructed to individually fill a questionnaire (Q0) that included a set of demographic questions as well as questions about online shopping habits with their partner and their couple's dynamic.

LookBack (Lookback Group Inc., Palo Alto, CA) software was used to remotely observe and listen to participants as they accomplished the experimental tasks from their home with their own computer. The software allowed us to capture a video stream of the couple's computer screen and to remotely communicate with the couple to provide instructions and moderate the tasks. Participants had to install the LookBack software before the experiment to be able to communicate with the researchers. At the scheduled time of the experiment, we greeted each couple on Lookback, and asked for their consent to record their audio, video. The whole experiment involved performing two tasks and filling two post-task questionnaires (one after each task). Both tasks had the same goal: couples were instructed to use a single computer to shop online together for a leisure

package. We asked the dyad to choose who wanted to start with having control of the browsing device (i.e., mouse or touchpad). We required that only the chosen person would be in control of the computer during each task, without directly prohibiting control exchange. We referred to the participant controlling the computer as the "active" partner and to the other one as the "passive" partner.

Each task was carried out using a different website: Half of the couples started with CoffretsPrestiges.com while the other half started with OutGo.com. These two websites offer leisure packages for restaurants, weekends away, activities and more. A $10 Amazon gift card was given to each participant as a retribution for their time, and a contest was set up such that every couple had the chance to win their chosen leisure package valued at $200. The contest was used as an incentive to increase couples' involvement in the tasks.

At the end of the first task, each participant had to individually answer a set of questions about their experience during this first task (Q1). Couples would then proceed to the second task, where the passive partner in the first task would become the active partner. After the task, participants individually filled another questionnaire about their experience during the second task (Q2).

4.4 Measurement

Overall, three questionnaires were administered individually to every participant: Q0, Q1 and Q2. Table 1 presents the constructs, their measurement items, and the questionnaire in which they were used.

Table 1. Constructs Measurement

Construct name	**Items**	**Scale**	**Q.**	**Source**
Control habit	1) I usually have more control over the mouse, keyboard, touchpad, touchscreen, when I'm shopping with my partner. *2) My partner usually has more control over the mouse, keyboard, touchpad, touchscreen, when I'm shopping with my partner.*[*]	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q1	New scale

Perceived affective conflict	1) My partner or I often got angry while doing the online shopping together 2) My partner or I often showed annoyance during the online shopping we did together 3) My partner and I were frustrated shopping online together	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q1 and Q2	(Ma et al., 2017)
Continuance intention	1) I intend to continue shopping online with my partner 2) My intentions are to continue shopping jointly with my partner rather than any alternative 3) *If I could, I would like to discontinue shopping online together with my partner*	7 point scale ranging from (1) I strongly agree to (7) I strongly disagree	Q1 and Q2	(Bhattacherjee, 2001)
Device use	To which extent do you use each of the following device settings to shop online together as a couple during normal times? Items: 1 smartphone, 2 smartphones, 1 tablet, 2 tablets, 1 computer, 2 computers.	7 point scale ranging from (1) Never to (7) Always.	Q0	New scale
Pleasure	Please move the cursor on the scale to measure your level of pleasure.	from 1 to 100	Q1 and Q2	(Betella & Verschure, 2016)
Arousal	Please move the cursor on the scale to measure your level of arousal.	from 1 to 100	Q1 and Q2	(Betella & Verschure, 2016)

Notes: · Italic items are negatively worded. Qo : Questionnaire administrated before the experiement . Q1: Questionnaire administrated after task 1. Q2: Questionnaire administrated after task 2.

4.5 Data analysis

Before testing our hypotheses, we assessed the measurement scales' reliability. Cronbach's alpha was 0.80 for perceived affective conflict, 0.80 for continuance intention, and 0.96 for control habit. For all our questionnaire data, we checked if the variables were normally distributed. Shapiro-Wilk test showed that pleasure, arousal, and continuance intention were not normally distributed (p-value < 0.1), therefore we transformed them into binary variables using their median as a split point (Iacobucci et al., 2015)

To test H1a, H1b, H3a and H3b, we ran logistic regressions with random intercepts modelling the probability that the dependent variables had a value of "1", meaning that it was higher than their median. We used age, gender, control habit and the device use (as

described above) as control variables. We used the random intercept method because of repeated measures (Baltagi, 2021).

We relied on a different method to test our second hypothesis (H2a, H2b). We used the Wilcoxon signed rank test, which is a non-parametric test. This allowed us to take into consideration the order in which participants went through the conditions (Rey & Neuhäuser, 2011). Concretely, we calculated the difference in our focal dependent variables (e.g., pleasure) between partner 1 (in control) and partner 2 (not in control) in the first task, obtaining a value which was labelled diff1, for "difference in Task 1". Then, we calculated the difference in pleasure between partner 1 (now not in control) and partner 2 (now in control) in Task 2 and labeled the obtained number diff2. We finally used the Wilcoxon signed rank test to compare diff1 and diff2.

4.6 Control variables

For the effect of control on users' emotional state and their continuance intention, we looked at which control variables were significant. From all the control variables, only the variable control habit (measured at t0, i.e., before the experiment) had a significant impact on pleasure. None of the control variables had any significant effect on arousal. As for continuance intention, only one device use configuration, which is the use of one computer, had a significant effect.

Regarding the effects of conflict on emotional state and continuance intention, only one device use configuration, which is the use of one computer, had a significant effect (on continuance intention).

Participant's gender was used a control variable for the analysis. Our analysis showed that gender did not have any effect on either pleasure, arousal, continuance intention or conflicts.

5. Results

5.1 Results for H1

We first found that participants who were in control of the browsing device reported significantly higher levels of pleasure compared to their partner who was not in control, providing support for H1a. This finding is based on the results of a logistic regression indicating that control had a significant positive effect on pleasure ($B = 0.8621$, $t(78) = 1.77$, $p = .041$). Similarly, participants who were in control of the browsing device reported significantly higher levels of *arousal* ($B = 0.7343$, $t(107) = 1.82$, $p = .035$) also supporting H1a.

We also observed that control had a significant effect on continuance intention ($B = 1.2985$, $t(78) = 1.93$, $p = .029$). Participants who were in control reported that they were more likely to do the experience again with their partner in the future when they finished the task, thus supporting H1b.

In summary, having control over the input device did yield a positive change in participants' levels of pleasure, arousal, and intention to continue shopping online with their partner.

5.2 Results for H2

The difference between the two partners' level of pleasure in the first task was larger (median = -2.5) than the difference between the partners' level of pleasure in the second task (median = -7.5), and a Wilcoxon signed-rank test indicated that this difference was significant ($W = 296$, $p = .023$). The deviation in experienced pleasure between partners attenuated when control was transferred from the initially active partner to the initially passive partner. In a similar vein, the difference between the two partners' level of arousal in the first task was larger (median = 4.5) than the difference between the participants' level of arousal in the second task (median = -7), and a Wilcoxon signed-rank test indicated that this difference was significant ($W = 331$, $p = .009$.). In other words, the difference in experienced arousal between partners also attenuated when control was transferred from the initially active partner to the initially passive partner. Altogether,

these results support H2a. Finally, the difference between the two partners' levels of continuance intention in the first task was larger (median = 0,33) than the difference calculated in the second task (median = -0.33), and a Wilcoxon signed-rank test indicated that this difference was significant (W = 198, p = .023). This provided support for H2b as well.

5.3 Results for H3

Our final set of analyses showed that affective conflicts did not have a significant effect on participants' pleasure (B = -0.5067, t(77)=-1.18, p= .120). Similarly, we found no significant relationship between participant's level of affective conflict and their arousal level (B = 0.4558, t(77) = 1.03, p = .153). Thus, H3a was not supported.

In contrast, we found that when participants reported having experienced more affective conflict, they were less likely to desire continuing shopping with their partner in the future (B = -2.4438, t(77) = -2.90, p = .002), which supported H3b.

The following table summarizes the hypotheses and results that emerged from the experiment.

Table 2. Summary of Results

Hypothesis	**Result**
H1a: Device control will influence users' emotional state such that active users will experience more positive emotions compared to their passive partners.	Supported
H1b: Device control will influence users' intention to keep shopping online with their partner such that active users will report higher continuance intentions compared to their passive partners.	Supported
H2a: The deviation in the emotional state within the couple attenuates when partners interchange control of the browsing device.	Supported
H2b: The deviation in continuance intention within the couple attenuates when partners interchange control of the browsing device.	Supported

H3a: Perceived affective conflict will negatively influence partners' emotional state.	Not supported
H3b: Perceived affective conflict will negatively influence partners' continuance intention.	Supported

6. Discussion

In this paper, we studied the impact of control and conflict on couples' co-located collaborative online shopping experience. We focused on two key outcomes: partners' emotional state (i.e., pleasure and arousal) and their continuance intention. An experiment conducted with 40 real-life co-located couples collaboratively shopping together yields three main contributions.

6.1 Theoretical Contributions

First, this study contributes to a better understanding of the consequences of device control (having it or not) in the context of a dyad (a co-located couple) collaborating to make a common purchase online. Our results show that when the participants were in control of the browsing device, their level of pleasure and arousal was significantly higher than that of their non-controlling partner. We had anticipated this result based on *flow theory*, which associates a sense of control with higher pleasure (L. Gao & Bai, 2014). Previous work on interactivity suggests that having more control leads to greater cognitive involvement (Liu & Shrum, 2002), and therefore, we speculate that the active partners in our experiment were more mentally and physically stimulated, explaining their higher level of arousal. Conjointly, we found that when participants were in control of the computer, they were more likely to report higher intentions to continue shopping online with their partner. The state of flow also explains that when individuals have control, they experience more pleasure and have a higher tendency to be willing to reproduce the experience in the future (L. Gao & Bai, 2014). Overall, although the impact of device control on user experience has been heavily researched in other contexts (e.g., video games (Schrader & Nett, 2018) and entertainment (Oh et al., 2014), we still do not know much about this phenomenon in the context of online shopping; this study thus contributes

to fill this gap by improving our understanding of this increasingly pervasive phenomenon.

Second, this study sheds light on the effects of taking turns during co-located collaborative online shopping, when there is only one input device available. Our results indicate that the deviation in pleasure and continuance intention between the active partner and the passive partner attenuated as they interchanged control. We had anticipated this result in light of the *social exchange theory* (Nakonezny & Denton, 2008), but what we did not theorize is how the pattern of the deviations would look like. In that regard, we observed that participants who started with having control over the browsing device ended up with almost no difference in their continuance intention between the first and second task, despite their pleasure and arousal slightly decreasing as they gave up control. This is interesting that the partner who went from having control to having no control in the second task exhibited similar level of continuance intention in both tasks. Our interpretation of this phenomenon is that initially active partners may be willing to incur the cost of giving away some of their pleasure and arousal from being in control in order to regulate or give back to their partner. This transaction does not seem to affect their continuance intention because there is a gain in pleasure and arousal for their partner. This is indeed a key mechanism in *social exchange theory* (Nakonezny & Denton, 2008). Partners weigh the benefits and cost of their actions and might conclude that when they lose some control over the device, it is not a total loss since their partner is enjoying the activity as well (Nakonezny & Denton, 2008). To our knowledge, very little research has focused on a dyad taking turns. Previous work examined the best way to have co-located groups collaborate online and found that giving everyone a separate input device was the best option (Myers et al., 2020). Thus, the present research contributes to this stream of work by paving the way for future studies to look into how co-located couples could take turns in sharing device control while online shopping. Knowing that the continuance intention of our participants remained quite stable when giving away control could indeed change the way that we see dyad's interaction with computers.

Third, this study contributes to our understanding of how conflicts might influence partners' emotional state and continuance intention while shopping online together. Contrary to our expectation, the study results indicate that perceived affective conflicts

did not have a significant effect on the participants' emotional state (both pleasure and arousal). We suspect that perceived affective conflicts might not have been intense enough to significantly affect the participant's pleasure or to stimulate their arousal. However, we found that participants who perceived more conflicts were less likely to desire engaging again in the experience of collaborative shopping with their partner (i.e., continuance intention). This effect, which we had anticipated, can be explained by theories of how users cope with conflict and how they often engage in withdrawal behaviors; couples might have lower intention to do the activity again to avoid the stress that affective conflict can bring (Pearlin & Schooler, 1978).

In summary, user control is not the only factor influencing a couple's intention to reproduce the experience of shopping online together: affective conflict is also an important influencing factor. Additionally, affective conflicts might impact the direct emotional state of couples (during the online shopping) less than their rationalized intention to reproduce the experience in the future.

6.2 Implications for practice

Our research has implications for UX researchers and designers, whom we encourage to investigate ways to make couples or simply dyads take turns in having control. In certain online shopping experiences, (e.g. house hunting, travel planning, buying furniture), collaboration is a necessity. In this context, the person who is tends to be the observer could benefit from taking turns with their partner. Our results show that the partner who is usually the active person will not want to discontinue the activity once they have given up control to their partner (continuance intentions remained high). We learn from this result that if websites can astutely get couples to switch controls while online shopping, they could increase the intention for both members to come back and shop online again.

Our results suggest that websites that are known to be used by couples collaboratively should propose to users the option to take turns on device control and to guide their collaborative browsing experience. For example, real estate websites could greatly benefit from having a version of their websites enabling each partner to pick their own criteria for which they are looking for in a house, condo, or apartment. This new version could

encourage partners to interchange control in a more interactive way when looking at houses. The website could also enable couples to compare two or three options, making it possible for partners to consider each of their favorite housing choices. Based on our results, we believe that this would indeed generate more positive emotions in the partner who would usually not get to control the computer, and that it will not diminish the intention for both partners to visit the website again. In the context of websites offering leisure packages, like the ones we used in our experiment, they could also improve the frequency with which couples re-visit their site by adopting a similar tactic. This could be operationalized by allowing couples to choose a "collaboration mode" in which each partner could take turns controlling and choosing the types of leisure activities that they want to do. This proposition is in line with previous research recommending that designers find ways to better guide collaborators through each of the steps leading to achieving the common goal (Briggs et al., 2009).

6.3 Limitations and Future Research

This research has some limitations. First, the sociological and cultural background of participants was not highly diversified and representative of the general population. All couples, except two, were heterosexuals. Additionally, most participants were in the 18 to 25 years old range. The fact that the age range wasn't very large or did not vary a lot may have prevented from observing age-related effects. Future research should strive to study couples with more diversified backgrounds and sexual orientation.

Second, we noticed that while switching controls, some participants were not used to controlling their partner's computer (e.g., Windows versus Mac computers), and that might have had an impact on their level of experience pleasure. Moreover, one partner could be more likely, in their "everyday life", to either naturally be the active partner or the passive partner, which may distort some of the effects.

Third, as the data collection was done remotely, we were not able to collect data using technology such as eye tracking (oculometry) or electrodermal activity, which would have given us the ability to gather more implicit insight on participants, without them having to report their own experience (de Guinea et al., 2014). Thus, we suggest that future

research examines couples in a laboratory setting instead of having them do the experiment remotely in order to capture those concealed emotional reactions. Indeed, a lab can be better equipped with technology enabling the surfacing of nuanced insights on a couple's user experience. For example, researchers were able to use synchronized dual eye-tracking to measure dyad gaze convergence in the context of joint use of a system by user dyads (Tchanou, Léger, Boasen, et al., 2020). They suggest that dyad gaze convergence influences dyad cognitive load and dyad performance. Future research may investigate the role of couples' gaze behavior during online shopping in a controlled laboratory setting. Researchers have also used Shared-Attention System theory to explore how one person's gaze can *lead* their partner's gaze to an object (Levine, 2018). Shared-Attention could thus be used to better understand the partners' feelings and mental process while shopping together online. Such perspective is interesting, as it may help explain how gaze convergence may influence participants' cognitive, emotional, and behavioral reactions.

Finally, we noticed that participants who were not controlling the computer kept pointing and telling the controlling participant what to do, which suggests that the concept of taking turns could also be examined from a behavioral angle. It would be particularly interesting to look at the relationship between power (e.g., the person in control) and the dominance behaviors exhibited by both partners.

7. Conclusion

To conclude, our study corroborated our main proposition based on *flow theory* that device control would have an important impact on a couple's collaborative online shopping experience, creating more positive emotion in the active partner than in the passive partner. We also found empirical support for the idea based on *social exchange theory* that turn taking would be beneficial for both partners. Overall, our results suggest that UX designers should look into astute ways to make couples shopping online take turns controlling the browsing device.

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Chapitre 4
Conclusion

Ce mémoire avait un objectif en particulier, soit celui de mieux comprendre comment les membres d'un couple interagissent avec un seul ordinateur, dans le contexte du magasinage en ligne. Plus spécifiquement, ce mémoire a permis de démystifier certains aspects de cette collaboration côte à côte qui fait partie de la vie de tous les jours d'une grande partie de la population.

Pour atteindre l'objectif fixé, des tests utilisateurs ont été menés avec 40 couples, à distance. Les séances ont été enregistrées par le logiciel Lookback (Lookback Group Inc. Palo Alto, CA), nous permettant pas la suite de codifier les enregistrements. De plus, les vidéos des participants nous ont permis de mesurer la valence émotionnelle, grâce à la détection des émotions faciales faite par le logiciel FaceReader (Noldus Information Technology Inc. Wageningen, Netherlands). Finalement, avec les questionnaires administrés après les deux tâches, nous avons demandé aux participants de noter leur état émotionnel (plaisir et niveau d'éveil), leur satisfaction, leur intention de continuer ainsi que leur perception de deux types de conflits.

Bien que les deux articles soient construits différemment, le premier étant exploratoire et le second étant confirmatoire, ils sont complémentaires et forment un ensemble permettant de mieux comprendre le sujet. Les deux articles mis ensemble sous forme d'un seul mémoire donnent par conséquent une meilleure image réelle du magasinage en ligne collaboratif.

Ce chapitre fait un rappel des questions de recherche ainsi des principaux résultats des deux articles mis en relation l'un avec l'autre. De plus, les contributions théoriques et pratiques de l'étude ainsi que les limites et pistes de recherches futures y sont présentées.

1. Rappel des questions de recherche

Ce mémoire aborde cinq questions de recherche précises, à travers deux articles. Le premier article aborde plus précisément les comportements adoptés par les partenaires

lors de l'achat en ligne collaboratif. Ainsi, les deux questions suivantes guide le premier article :

1) Quels comportements le partenaire en contrôle des périphériques de l'ordinateur (personne active) et le partenaire non en contrôle des périphériques (partenaire passif) adoptent-ils pendant l'achat en ligne collaboratif ?

2) Quels sont les effets de ces comportements sur l'expérience utilisateur des deux partenaires ?

En ce qui concerne le second article, les questions de recherche abordent davantage l'effet du contrôle des périphériques de l'ordinateur sur les partenaires en plus d'aborder le sujet des conflits qui peuvent émerger d'une situation d'asymétrie de contrôle. Les questions de recherche auxquelles nous tentons de répondre sont donc les suivantes :

1) Comment le fait d'avoir le contrôle des périphériques de navigation influence-t-il l'expérience d'achat en ligne des couples?

2) Quel est l'effet d'alterner le contrôle des périphériques de l'ordinateur entre les partenaires sur l'expérience du couple?

3) Comment les conflits qui peuvent émerger dans une situation d'asymétrie de contrôle affectent-ils l'intention des partenaires de continuer à faire du magasinage en ligne ensemble?

2. Principaux résultats

Les résultats principaux sont présentés dans l'ordre des questions de recherche présentées à la section précédente.

Deux catégories de comportements ont été plus souvent observés chez les couples ayant participé à notre expérience. La première catégorie, *positive common behaviors*, continent deux comportements, agreement et communication talk. Ces comportements ont été respectivement codés en moyenne 18,97 fois par tâche et 14,19 fois par tâche. Une deuxième catégorie de comportements fut observée plus souvent, dont deux

comportements en particulier, *passive points the screen* (participant passif pointe l'écran) et *passive tells what to do* (participant passif dit quoi faire). Le participant passif avait en effet tendance à pointer l'écran de l'ordinateur ainsi qu'à dire à son/sa partenaire quoi faire. Le comportement *partenaire passif dit quoi faire* a été observé en moyenne 18,14 fois par tâche. Par exemple, si la personne passive disait à son/sa partenaire de reculer d'une page, ou de descendre plus bas sur la page, ou d'attendre avant de changer de page afin de terminer de lire, les chercheurs codifiaient le comportement comme étant *le/la partenaire passiv(e) dit quoi faire*.

Les différents comportements des deux partenaires ont eu plusieurs effets sur l'état émotionnel des partenaires (plaisir et éveil), leur satisfaction, leur intention de continuer ainsi que leur perception des conflits. Le plus longtemps et le plus souvent le participant passif adoptaient des types de comportements dit *dominants*, le plus élevé son état émotionnel ainsi que son intention de refaire l'expérience étaient. Il ou elle semblait donc éprouver plus de plaisir et être en plus grand état d'éveil et avait une plus grande intention de refaire l'expérience. Pointer l'écran, en plus d'être un comportement fréquent, n'en est pas un qui semble rendre l'expérience désagréable, ni pour le partenaire passif que l'actif. Cependant, le comportement *participant passif dit quoi faire* en est un qui déplait davantage au participant actif. En résumé, la personne passive semble apprécier se sentir plus en contrôle en ayant des comportements que l'on qualifie de dominants, alors que ce sont des comportements qui sont nuisibles pour l'expérience de leur partenaire en mode actif.

Les résultats du second article démontrent que les partenaires en contrôle des périphériques vivent davantage d'émotions positives (plaisir, état d'éveil et intention de continuer) comparativement à leur partenaire. De plus, il est très intéressant de voir que lors de l'échange du contrôle entre les deux partenaires, il semble y avoir un équilibre qui se forme. En effet, le plaisir, l'excitation (état d'éveil) ainsi que l'intention de continuer de la personne donnant le contrôle à son/sa partenaire ne diminue pas significativement une fois que celle-ci n'est plus en contrôle. En revanche, le plaisir, l'excitation et l'intention de continuer du participant passant de passif à actif augmentent significativement.

Finalement, nous avons aussi trouvé que la perception de conflits durant une séance de magasinage à deux en ligne n'influence pas significativement l'état émotionnel des participants. Cependant, une plus grande perception des conflits a un impact significatif et négatif sur l'intention de refaire l'expérience.

3. Contributions théoriques et pratiques de l'étude

Le magasinage en ligne à deux ou plusieurs personnes est un sujet qui intéresse les chercheurs depuis plusieurs années. Pourtant, bien que le magasinage à deux en ligne *à distance* ait été exploré (p. ex :(Y. Gao et al., 2016; Goswami & Hai Teo, 2007; Kim et al., 2013; Topaloglu, 2013; Yue et al., 2014; Zhu et al., 2010) le magasinage en ligne à deux personnes, assises côte à côte, est un sujet qui fut délaissé dans les dernières années (Tchanou, Léger, Senecal, et al., 2020). Ce mémoire avait donc comme objectif d'amener de nouveaux *insights* sur la collaboration en ligne à deux, plus précisément dans le cas d'un couple.

Le premier article met en lumière certains comportements associés autant aux personnes en contrôle de l'ordinateur qu'aux observateurs. Cet article contribue à alimenter la littérature sur le magasinage en ligne à deux, côte à côte (*co-located collaborative online shopping).* Nos résultats contribuent aussi à la théorie du pouvoir dyadique (the *dyadic power theory*) puisque nos découvertes vont dans le même sens que la théorie de Dunbar et Burgoon (1998) selon laquelle les personnes qui se sentent moins puissantes ont tendance à avoir davantage de comportements dominants.

De plus, toujours concernant le premier article, les résultats tirés de nos analyses statistiques démontrent que certains comportements sont nuisibles pour la collaboration. Nous croyons que notre recherche contribue à mieux identifier les points de friction que vivent les couples lors de la collaboration en ligne. Puisque nous avons mesuré l'intention de continuer ou de refaire le magasinage en ligne ensemble (*continuance intention*), nos résultats démontrent que certains comportements peuvent diminuer l'envie de refaire l'expérience. Or, les commerces en ligne gagnent à avoir des clients loyaux qui reviennent fréquemment (Mohamed et al., 2014). Nous croyons que cet article est une piste de solution afin de développer de meilleures façons pour les couples de magasiner ensemble

en ligne. Certains sites Web, comme les sites de voyages et de tourisme, sont très fréquentés par les couples (Tchanou, Léger, Senecal, et al., 2020). Ce type de sites Web serait le parfait exemple pour l'intégration d'une fonctionnalité permettant le partage des contrôles entre les partenaires. Nous développons davantage sur cette idée dans la section suivante sur les pistes de recherches futures.

Les résultats de notre second article confirment aussi l'idée décrite précédemment. En effet, nous avons démontré qu'en échangeant les contrôles de l'ordinateur, la personne qui était préalablement passive (sans contrôle) et qui devient active (avec contrôle) durant le magasinage a soudainement plus de plaisir et une plus grande intention de continuer ou de refaire l'expérience. Nos résultats du deuxième article contribuent donc à soutenir l'idée d'une fonctionnalité qui permet l'échange de contrôle.

De plus, les résultats du second article contribuent à faire avancer la théorie sur le contrôle des périphériques, son influence sur les utilisateurs ainsi que sur l'échange des contrôles. De façon similaire au premier article, le deuxième permet d'identifier des facteurs influençant le désir de magasiner en ligne avec son ou sa partenaire à nouveau, ce qui est important aujourd'hui dans un monde en constant évolution digitale.

3.1 Implications pour la pratique UX

Du côté de la recherche UX et du design UX, notre étude contribue à comprendre et à identifier les points de friction que peuvent vivre des utilisateurs lors de l'utilisation d'un seul ordinateur à deux. Comme mentionné précédemment, les individus peuvent collaborer à deux sur un seul ordinateur dans plusieurs contextes, non seulement dans le cas d'un achat en ligne (Amershi & Morris, 2008). Cette étude contribue donc à mieux cerner la collaboration à deux sur un seul ordinateur et pourrait permettre à des chercheurs dans d'autres contextes de formuler des hypothèses pour leur recherche ou étude.

Pour les designers UX, nous croyons qu'il pourrait être intéressant de construire une fonctionnalité qui permettrait aux dyades (ou groupes de plus de deux personnes) de collaborer de façon plus efficace. Par exemple, un site de logements locatifs touristiques pourrait offrir aux utilisateurs la fonction *magasiner à plusieurs* et pourrait permettre aux

collaborateurs de choisir à tour de rôle, en s'échangeant les périphériques de l'ordinateur, les logements ou chambres qu'ils aiment. Par la suite, les collaborateurs pourraient comparer les différentes options choisies par chacun. Il serait alors beaucoup plus facile pour chaque partenaire de se souvenir des préférences de l'autre. Ce type de fonctionnalité pourrait d'ailleurs améliorer la communication entre les collaborateurs et diminuerait la fréquence du type de comportement *partenaire passif dit quoi faire* puisque les deux personnes auraient à tour de rôle la capacité de contrôler l'ordinateur. Évidemment, en UX, toute fonctionnalité doit être testée afin d'être certain de sa pertinence et de son efficacité, il serait donc important pour une équipe UX d'essayer ce genre d'outils avec de vrais couples avant de lancer le projet en ligne.

4. Limites et pistes de recherches futures

Plusieurs limites sont à considérer dans cette étude. Premièrement, les participants n'étaient pas très diversifiés. La plupart des couples se situaient dans le même groupe d'âge, détenaient un diplôme de premier cycle universitaire et étaient ensemble depuis plus d'un an. De plus, notre échantillon ne contenait que deux couples homosexuels. Il serait important et très pertinent pour les futures recherches d'inclure plus de diversité dans l'échantillon, incluant davantage de diversité ethnique.

Ensuite, les participants n'étaient pas toujours placés dans la situation la plus naturelle pour eux. Puisque les chercheurs devaient être en mesure de voir les visages des deux membres du couple dans le même enregistrement vidéo, les participants devaient être assis proche l'un de l'autre devant l'écran. De plus, afin de s'assurer de la qualité des vidéos, les répondants devaient avoir placé leur ordinateur sur une surface stable, souvent un bureau ou une table. Naturellement, un couple aurait possiblement magasiné ensemble assis dans leur lit ou sur le divan. En effet, une étude révèle que les couples magasinent ensemble en ligne de leur chambre ou du divan (Tchanou, Léger, Senecal, et al., 2020).

Il est important de mentionner que le magasinage en ligne pour des articles ou services peuvent être fait sur plusieurs jours. Afin d'être capable de collecter des données dans un lapse de temps raisonnable, les chercheurs ont dû limiter le temps de recherche des participants à moins d'une heure et 30 minutes. Cependant, dans un autre contexte, les

couples peuvent effectuer des recherches sur plusieurs jours, voire plusieurs semaines. Ainsi, il serait pertinent de faire une étude longitudinale avec des couples magasinant des maisons par exemple, puisque c'est un processus qui peut s'étendre sur des mois.

Une autre limite est le nombre de dispositifs permis lors de l'expérience. En effet, il était demandé aux participants de magasiner ensemble sur un seul ordinateur afin de concentrer la recherche sur l'utilisation de cet appareil. Par conséquent, les participants n'ont pas utilisé leur téléphone pour naviguer séparément. Nous savons que certains achats se font sur plusieurs jours, mais aussi sur plusieurs appareils. Le parcours d'un client peut commencer sur son téléphone intelligent et se terminer avec son partenaire sur un seul ordinateur lorsque le choix final est fait et que l'article ou le service est prêt à être acheté. Encore une fois, une étude longitudinale sur plusieurs semaines pourrait être intéressante puisqu'il serait possible pour les partenaires d'utiliser plusieurs appareils pour effectuer leurs recherches et leur magasinage. De plus, puisque les couples n'utilisaient que l'ordinateur d'un des deux partenaires pendant l'expérience, certains étaient moins à l'aise et avaient plus de difficulté à naviguer dû au model du portable de leur partenaire auquel ils sont moins habitués (Mac versus Windows).

Pour une future recherche, il serait intéressant de conduire une expérience longitudinale. Cette recherche pourrait consister à cibler des couples magasinant des maisons en ligne et pourrait analyser les différentes étapes d'un processus d'achat. Des outils de recherche UX sont déjà disponibles afin de réaliser ce genre d'étude sur plusieurs semaines; *Un journal de bord* pourrait permettre aux participants d'écrire et de noter chaque séance de magasinage. Cette méthode devrait être jumelée à d'autres afin d'assurer une recherche encore plus complète. Par exemple, ce type d'étude pourrait aussi inclure plusieurs entrevues et moments d'observation (moments où le couple magasine en ligne et l'on peut observer les partenaires grâce à l'enregistrement de leur écran ainsi que de leur visage). Il pourrait être même pertinent d'observer le couple lors de ses visites physiques aux maisons ou condos, afin d'enrichir l'étude.

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